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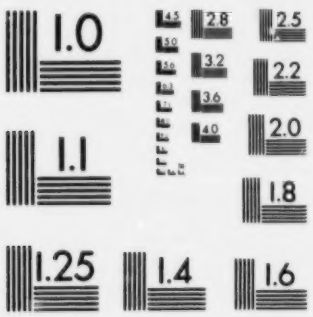

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University Management Education and Research: A Developing Crisis

Report by the
Consultative Group on
Research and Graduate Education in Business,
Management and Administrative Studies

Social Sciences and Humanities Research Council of Canada
Conseil de recherches en sciences humaines du Canada

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to the
Social Sciences and Humanities
Research Council of Canada

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FOREWORD

The Social Sciences and Humanities Research Council, concerned about the particular problems facing management and administrative studies in Canada, took steps in the first year of its operation to launch a review of the situation and to look for solutions. In March 1979 the Council announced the establishment of an independent 12-member Consultative Group under the chairmanship of Dr. Laurent Picard, Dean of the Faculty of Management, McGill University.

The terms of reference of the Consultative Group and the list of its members are set out in appendices A and B of this report.

In November 1979, the Group submitted its report to the Council and on December 12 met with representatives of the Council and of the Council's Advisory Academic Panel to discuss the focus and intent of the report. The document was formally received by the Council at its December 13-14 meeting and it was agreed that it would be made available in both official languages.

In reviewing the report, however, the Council first points out that it cannot endorse it in its entirety. It notes, regretfully, that the Consultative Group did not address certain essential portions of its terms of reference - namely, defining the nature of research in the field, making an inventory of this research, and identifying the status of the relationship between graduate studies in management and administration and the profession itself.

The Council also finds that it cannot accept the principal recommendation of the report - which is to establish a new research council, specifically for management and administrative studies. The creation of such a Council would in the Council's view cause a degree of setback in this discipline that it can ill afford, and would contribute to the already not inconsiderable problem of interdisciplinary projects that overlap among the grants programs of the three existing research councils.

On the other hand, the Council is fully aware of the problems in development of the management discipline. It now has in hand a report which has pinpointed certain serious weaknesses and proposed certain solutions, and it intends to give priority to setting the proper mechanisms in place to promote research and graduate studies in management and administration. One of the most useful means at present, and one which would assist the management profession in the short term, would be to place these concerns among the list of topics in our program of grants for research in areas of national interest, and to invite

universities and individual researchers to focus on the problem. Also in line with this objective the Council has decided to establish immediately a doctoral completion grants program and a program of research workshops in management and administration science. We shall look to university Faculties of Management, and to the Administrative Sciences Association of Canada to assist us in making a success of these new programs and in undertaking others with the same goals and objectives.

André Fortier
President

April 1980

PREFACE

The Consultative Group on Research and Graduate Education in Business, Management and Administrative Studies is the culmination of more than a decade of concern about the state of management education in Canada. Eleven years ago, in its Fifth Annual Review, the Economic Council of Canada observed:

> ....The total resources devoted to university business education and related research in this field have been woefully inadequate....

This theme was taken up again in 1975 by the Commission on Canadian Studies (Symons Report):

> Despite the important role played by business in the development of Canada, business education has a relatively short history in this country....Indeed, business education was neglected at all but a few universities in Canada until the 1960s.

Over the last three years, the Canadian Federation of Deans of Management and Administrative Studies became increasingly concerned about university management education and research, and began to document the deficiencies that exist. In the spring of 1978 the Federation conducted a three-day strategy conference at which it discussed not only management schools in the 1980s, but also the social, political and economic environment Canada will be facing.

A year later the Social Sciences and Humanities Research Council of Canada established the Consultative Group to define the nature and survey the state of management research in Canada, to examine graduate education, and to make recommendations.[1]

These general issues are also being addressed by the American Assembly Collegiate Schools of Business and the European Foundation for Management Development, and through the Consultative Group's activities, Canada has moved into the forefront of these international deliberations.

The Consultative Group concluded that we should not take full advantage of the terms of reference. In particular, we did not do a massive, exhaustive study of the state of research in Management and Administrative Studies. Previous studies and our own investigations indicated that the situation seemed all too clear. As well, we did not comprehensively define the nature of research in the field. Our discussion in the text and Dr. Mattessich's excellent paper for the Group[2], however, provide a good beginning in that process. Finally, we were not able to draw general conclusions for other professional fields, especially in the social sciences and humanities. Those other areas are too different in nature from Management and Administrative Studies to compare with any real confidence. Only a separate Consultative Group, with a more widely-representative professional membership, would be capable of such a task.

Our work, instead, has been oriented in two major directions: to look at Management and Administrative Studies from a wider, socio-economic perspective; and to identify key problem areas, and to act as a catalyst for change. We have taken very seriously indeed our mandate to recommend improvements, "particularly as they reflect national concerns".

The Group members are grateful to have worked under the umbrella of the SSHRCC, and in particular, to have had the services of Alf Chaiton as Executive Secretary, and the guidance of the Vice-President, Professor Tom Symons. The SSHRCC is to be commended for giving the Group wide-ranging terms of reference and ensuring the broadly based composition of its membership.

Within six months the Group arrived at a consensus about its major thrust, although individual members may have reservations about particular recommendations. We felt the subject to be of such importance that we issued an Interim Report for public discussion at a national working conference sponsored by the Canadian Federation of Deans of Management and Administrative Studies, "Managing in the 1980's: The Crisis in Management Education and Research", October 1-3, 1979.[3] The Final Report has been revised in light of the conference discussion.

December 3, 1979

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[1]See the Terms of Reference and composition of the Consultative Group in Appendices A and B.

[2]See Appendix G.

[3]See Appendix F.

ACKNOWLEDGEMENTS

We wish to acknowledge the role of the Social Sciences and Humanities Research Council of Canada, which created this Consultative Group and provided human and financial support. Disagreement over some issues in no way restricted the help given by the SSHRCC in the preparation of the Report. Mention should be made of the secretarial assistance of Marcelle Perry, Sandra Meyers, and Theresa Joanette.

The Canadian Federation of Deans of Management and Administrative Studies and its Chairman, Dean Max Clarkson, also deserve our appreciation. The Consultative Group was the result of considerable preparatory work on their part, and we thank them for their continuous support. Our gratitude is also extended to the Administrative Sciences Association of Canada, and its President, Dr. Allan Blair. Dean Clarkson and Dr. Blair served as associate members of the Consultative Group. Alf Chaiton, as Executive Secretary and Research Associate, provided invaluable assistance in completing the Report and maximizing the effectiveness of the Group. Dr. Stanley Shapiro made a significant contribution to the drafting of the Final Report. As a result of the efforts of all concerned, this Report was completed in little more than nine months and after only four Group meetings.

A special tribute has to go to Dr. Max von Zur-Muehlen. Even before management schools began to look at the problem, he was describing the situation and studying its many implications. For more than ten years, his books, reports and articles have traced key developments. Most of the findings in this Report originated from his research. Any improvement in management education in this country, directly or indirectly, owes an immeasurable debt to Dr. von Zur-Muehlen's efforts.

Throughout its work, the Consultative Group has relied on Statistics Canada not only for data about education and the labour market, but also for statistical series of socio-economic indicators which monitor the performance of the Canadian economy, and provide a basis for comparison with other countries. The Group believes that the services of this national agency have not been adequately recognized, and we wish to express our appreciation and support for its endeavours. This Report could not have been written without Statistics Canada data, which were readily available, accessible, and timely.

SYNOPSIS

In this Report the Consultative Group on Research and Graduate Education in Business, Management and Administrative Studies identifies some of the problem areas and needs in Management and Administrative Studies in Canada, and makes a number of recommendations which we feel will improve the quantity and quality of management education and research.

In summary, we recommend that:

1) Management education and research be designated a priority national concern and, as such, be the recipient of a strategic grant of $3 million per year (in 1980 dollars).

2) Approximately $1.8 million of this amount be designated for a variety of programs to increase the number of Ph.D.-qualified professors teaching in Canadian faculties of Management and Administrative Studies.

3) Approximately $1.2 million a year be available to support the research efforts of Canada's professors of Management and Administrative Studies.

4) The administration of these two strategic grant programs become the primary concern of a new Management Research Council.

INTRODUCTION

Canada is facing an economic paradox. One of the richest countries in the world, we suffer unemployment, inflation, a weak dollar, a huge deficit - to name only some of our problems.

Among the few resources over which a nation has significant control are its managerial and administrative skills. With the problems mentioned above, and as we move toward a more and more managerial and organizational society, it is reasonable to assume that this country would develop those scarce resources. But as you will see, almost everything in this Report points to the contrary.

The demand for management education at Canadian universities has increased in the last few years, despite a general levelling off in most other disciplines. But because of a lack of financial and human resources, most management faculties have been forced to reject applications from students who normally would have been accepted. Moreover, this has discouraged other potential students from applying. Meanwhile, government and the private sector repeatedly emphasize the need for more and better trained managers.

This is our paradox - a rich country plagued by complex economic problems, where the rising demand for professional managers cannot be met by the post-secondary sector because of lack of resources.

Thus, two major considerations form the basis of this report:

a) we are moving toward a managerial and organizational society, and

b) management education and research in this country are in a condition approaching crisis.

As an example, one of the most significant national challenges of the 1980s will be adaptation of the Canadian economy to the new GATT agreement. In effect, the remnants of the old "National Policy" will be discarded, as will other protectionist devices. The consequent restructuring of Canadian business institutions and the required improvement in their economic behaviour will place great pressure on our management competence. For instance, evolution of branch-plant operations under the new tariff regime will be toward significant world product mandating. Instead of producing a wide variety of products for the Canadian market, these businesses will be instructed to produce one or more lines which will then be sold on a world-wide basis. Such a change will require managers able to function on a global scale. If this management pool is not forthcoming, foreign talent will be imported, or the plants moved to the U.S. or to countries where the skills are more readily available.

Independent Canadian businesses will also be placed under greater pressure as protectionist walls come down. Without better cost control, marketing and technological development, these firms will face stiff foreign competition at a severe disadvantage. There is evidence that federal and provincial programs and funds will be available for upgrading of corporate capabilities, but without the professional managers to use these programs and funds, nothing much will come of these good intentions.

The GATT agreements will be implemented over eight years beginning January 1, 1980. Within a decade, then, we can expect a fundamental restructuring of the Canadian business complex. If we do not have the people with the skills to manage this massive change, present economic conditions will deteriorate further. It is an important national concern and should be seen as a matter of urgency.

Most industrialized countries, including Britain, France, Germany, Sweden, and the U.S., have concerned themselves with the quantity and quality of their managerial cadre, specifically, educated executives and entrepreneurs in the public and private sectors. This has not been the case in Canada. Financial resources, properly trained staff, and research endeavours have been disproportionately lacking. Nonetheless, the quality of research and teaching in management has risen substantially in the last decade; but there is still a long way to go.

University management education is multidisciplinary in nature, extending over a range from the behavioural sciences to abstract mathematical modelling. The SSHRCC and the Natural Sciences and Engineering Research Council have mainly been developed along traditional, single-disciplinary dimensions. The bulk of research in Management and Administrative Studies falls outside this model, resembling much more the type of projects supported by the Medical Research Council.

Because of the many constituencies involved (federal and provincial governments, universities, research councils, etc.), it is hard to present an integrated view. This document is obviously not the place to discuss constitutional matters or universities' policies and administrative behaviour. However, a major effort is needed to resolve the problems of management education and research in the university setting. Therefore, a number of recommendations are made at the end of this Report.

It is important to respond quickly to some of the recommendations, for specific improvements are possible in the short term. But a change in the overall situation will require major structural adjustments, and changes in attitude.

However, given:

a) the extent of the current situation,

b) the importance of management studies and practice for our country, and

c) the multidisciplinary nature of the field,

it is the consensus of the Consultative Group that a Management Research Council influenced by the model of the Medical Research Council should be created. Only with such an agency can the necessary attention be given to the problem of managing the future in this country. It is imperative that this be done as soon as possible to overcome the lags and delays already suffered.

THE QUALITY OF CANADIAN MANAGEMENT

From the 1870s to the 1960s, Canada's growth in real product per capita was about 1.8% per year, or a doubling about every 39 years. For the 1970s the Economic Council projected an annual increase of 4.1% which halved the doubling time to about 18 years.[1] It has been estimated that around 80% of the increase in output per person employed has come from technological (including managerial and organizational) change and more effective use of resources, rather than from more resources per person.[2] This quickening of the pace of economic growth presents a formidable challenge, with the emphasis on technological change and managerial performance.

A decade ago the Economic Council noted the importance of research and development (R & D) expenditures and the supply of scientific and technical manpower, but warned that these factors by themselves may add little to economic growth.[3] It is the process of innovation--beginning when management decides to move from R & D into engineering, design, and all the succeeding stages of organization and commercialization--that brings about new products and services, and contributes to growth. The Council commented that the United States held a large edge over its Canadian and European competitors in the ability to integrate R & D with the total innovative process--to go beyond R & D to financing, production, marketing, sales, and service. In the U.S. only 5 - 10% of the total cost in the successful development of products is concerned with R & D.[4] "If innovative activity is to be stimulated and encouraged, both public and private efforts must be directed over a much broader range of effort than R & D. There is danger that policy-makers will concentrate on support of R & D."[5] The Council warned that no amount of scientific excellence or increased expenditure for R & D will improve economic performance if management is unskilled. Of special concern, therefore, was the fact that the educational attainment of Canada's owner-managers was, on average, lower than in the U.S., a wider gap than for almost all other occupational groups.[6]

The Council concluded that "Canada appears to be particularly far behind the United States in the relative scale of resources devoted to the field of university business education, and university research in this area",[7] and that "no task may be more important for improving Canada's innovative performance than to strengthen the capabilities of Canadian management...".[8]

But ten years later, the situation had apparently changed little. The D'Avignon Committee on Personnel Management in the Public Service reported that both managers and employees share the concern that "today's managers fall short in their management of their staffs".[9] The Lambert Commission on Financial Management and Accountability recommended substantial changes in the organization of the federal government because of what the Commissioners felt was a "lack of concern within government about the quality of management itself".[10] In addition, a series of twenty-three studies by the Ministry of Industry, Trade and Commerce have drawn attention to managerial and competitive deficiencies that seem to prevail in some industrial sectors. A number of these studies cited the quality and style of Canadian management as the major factor contributing to the weak performance of many companies.

The connection between formal education and management performance is difficult to assess, but it has been mentioned by credible observers with increasing frequency. A 1970 report by the Department of Industry, Trade and Commerce noted:

> The future performance of Canadian industry will increasingly depend on its ability to achieve and maintain a high level of managerial competence. To meet this challenge, Canadian industry must have available to it an adequate supply of professionally trained managers and ample facilities for periodic "upgrading" of practising executives. The main responsibility for meeting these additional needs for well-trained, up-to-date management lies with our universities.[11]

This theme was not lost on Canadian nationalists. At its first policy convention in 1972, the Committee for an Independent Canada passed a resolution that "there is a need for our universities to devote more personnel and budget resources towards improving the quality of business education in Canada".[12]

The Special Committee of the Senate on Science Policy (the Lamontagne Committee) described management schools as "the main centres of research on the complex problems of R & D management and innovative strategies, since it is essential to build a coupling between research and training in this area." However in its four volumes, published over a span of seven years, the Committee did not follow through on this issue.[13]

As recently as 1978, the Science Council,[14] the Ministry of State for Science and Technology,[15] and the Economic Council's Fifteenth Annual Review[16] hypothesized that Canada's poor performance in productivity and international competition is due, at least in part, to lower levels of education, training, and entrepreneurial skills in both the public and private sectors. Thus, the importance of management has been stressed repeatedly. However, this recognition of a "management gap"[17] has not led to any formal initiatives. Indeed, many crucial questions, such as the possible link between the quality of management, the education attainment of managers, and Canada's economic and organizational performance, have not been adequately investigated.

Dean Max Clarkson has suggested an explanation for this reluctance to investigate the role of management in the Canadian socio-economic system:

> It is not easy to measure the essential characteristics and attributes of the manager, such as skills in organizing, planning and decision-making, or the ability to communicate, to be flexible, to deal with stress and uncertainty, to take risks and to lead. These managerial characteristics are not easily quantifiable, and therefore do not fit neatly into cost-benefit analyses or other measures of productivity. Canadian studies seem to have devoted much more attention to concrete components of production, like labour and capital, and to issues like foreign ownership and technological gaps.[18]

The results of this neglect have been pointed out dramatically in a number of recent reports on government and the economy. For example, Don Daly commented that "it takes Canada longer to introduce new technology than any of the (other) industrial countries", and that "an important aspect of the problem is a lack of formal training in the relevant skills of management decision-making."19 The absence of remedial action is especially unfortunate because Canada's industrial structure must move away from the traditional, often resource- and service-based industries, to "third wave industrialization", in which the application of managerial as well as scientific, technological knowledge is of paramount importance. It is within that framework that we should look at the development of Management and Administrative Studies during the 1970s.

CANADIAN MANAGEMENT EDUCATION

The outstanding feature of university management education in the past decade has been quantitative (and qualitative) growth (Tables 1 to 5). The main push has come from the students themselves, who are enrolling in professional and career-oriented disciplines that afford them a labour market advantage in contrast to the diminishing direct employment opportunities for many of the arts and science graduates. As one observer has noted: "Students seem to be disillusioned with university education. They're avoiding the faculties of arts and sciences and are more interested in the vocational areas because they think that's where there will be a job."[20] It might also be noted that the perceptions and values of today's students about the direction they can best serve society have been changing, and many seem to have concluded that a managerial role in the private or public sector is a valuable social function.

Students are, in effect, voting with their feet. In 1976-77, 32,376 full-time university undergraduates were enrolled in Management and Administrative Studies; 21,628 part-time undergraduates; 2,773 full-time and 2,933 part-time Master's students, and 121 at the doctoral level. An additional 33,164 full-time students were taking business subjects at community colleges. Numbers have continued to rise so that management schools now make up about 12% of total enrolment - or doubling during the 1970s. As well, a significant number of students in other disciplines take one or two management courses in their programs.

Most management schools have various means, formal or informal, of limiting enrolment: e.g., quotas, high entrance requirements, and early application deadlines. Such controlled growth leads to low acceptance rates. For example, to be considered for the School of Business at Queen's University, a graduating high school student needs an 80% average. In the past year at that university, 2,500 students applied for the 160 available places and many others selected enrolment in arts and science with the hope of eventual transfer to the business school. It has been estimated that the 1979-80 demand for first-year management studies in Ontario is 16% higher than 1978-79.

Most major M.B.A. programs receive more than three times as many applications as places available. While precise figures are difficult to assemble, it is clear that literally thousands of qualified applicants are being turned away, both at the undergraduate and M.B.A. levels.

A key question is whether this growth is a cyclical or lasting (structural) phenomenon. The U.S. experience is of value, as Canadian growth patterns seem to follow the American, although a few years behind (Tables 6 and 7). Enrolment in U.S. management schools makes up 22.2% of the first-year students, and has been growing for most of the seventies (Table 8). The Consultative Group believes that the Canadian trend is similar, although numbers are projected to level off at a somewhat lower proportion of total enrolment because the parallelism cannot be pressed too hard. But the phenomenon is much more than cyclical or faddish.

The universities, however, are allocating insufficient resources to accommodate even the current demand. The Tables in this section show that business schools receive a disproportionately low share of faculty and operating budgets for the students they are teaching. As a very crude approximation, this means a student/teacher ratio that is more than double the average (33:1 versus 16:1). To bring this ratio down to the average level would require additional faculty in very sizeable numbers. Even to lower it to 25:1 would require about 500 more.

The situation is complicated, of course, by the projection that enrolment will continue to rise about 10% annually over the next five years. The Consultative Group estimates that there is a minimum need for about 1,000 new management faculty over that period. However, finding them will be no mean feat. The reason is simply the dearth of qualified individuals, especially with doctoral degrees or equivalent training, given the relative attractiveness of competing opportunities. Universities, after all, are perceived as a declining industry.

Undergraduate and Master's enrolment in management amounts to between 12% and 14% of the totals at the two levels, but doctoral students in business make up only 0.9% of all Ph.D. enrolment. Up to the present, fewer than 100 doctoral management degrees have been granted in Canada since establishment of the first program in 1962. Table 10 indicates the employment pattern of Ph.D. graduates. Of 89 graduates, 64 (72.7%) are teaching at Canadian universities, and another 8 (9.1%) are employed in non-university positions in Canada. The latter demands will probably become more significant in the future.

Table 11 shows the discrepancy in output compared with the U.S., where approximately 1000 doctoral degrees in management are awarded annually. Prorated on a 10:1 population ratio, this means that Canada is producing at about one-eighth the American level, too much of a discrepancy to ignore or explain away complacently.

A possible partial reason for this deficit has been inadequate support from the SSHRCC Doctoral Fellowship Program. The number of fellowships awarded to management students has actually declined from its peak in the early 1970s (Table 12). This past year, 26 of the 1,333 students receiving support were in management disciplines, compared with 64 in Philosophy, 80 in Economics, 97 in Education, 104 in Political Science, 197 in Sociology, 144 in History, 186 in Psychology, and 232 in Language and Literature. The awards, then, seem strikingly mismatched with employment opportunities, even though this factor may not dominate the considerations.

Yet perhaps the single most important reason for the shortage of doctoral students is the opportunity cost to M.B.A. graduates of pursuing a Ph.D. At present, their employment prospects and income are so good as to discourage interest in doctoral studies. According to Business Week, an M.B.A. can expect a starting salary well above $20,000, compared with $21,000 for a new faculty member, and without sacrificing three to five years' income and experience.21

It has also been speculated that since the doctoral degree in business is such a new phenomenon, potential students are ill-informed about the employment opportunities, both in the university and the public and private sectors. At the same time, within the university community, many of the traditional disciplinary departments have been hesitant to encourage enrolment in this type of innovative doctoral program, which is so much of an interdisciplinary nature.

Ironically, the resultant situation is quite different from that in most of the other disciplines: faculty vacancies are high in management (in 1979-80, a minimum of 150 full-time positions), but almost non-existent in many traditional disciplines (Table 13).

It has been suggested that the increased demand for professional education, especially in management, is evidence of a structural weakness in Canada's university system. In a background paper prepared for the Consultative Group, Max von Zur-Muehlen asserts that a major problem in the funding of management education has been the educational philosophy and objectives of Canadian universities:

> Generalizations are unfair, but the attitude of the academic community seemed to be that training with an essentially practical bent was unworthy of university-level study, a perception which has continued in various forms to the present. Universities have been and are oriented toward theoretical disciplines. Not surprisingly, then, they have reacted rather slowly to new realities. But their traditional orientation may be on a collision course with a society that is demanding programs with greater applicability to the labour market.
>
> In most provinces, government financial support to universities is determined by the number of students, and their field and level of study. But although the growing ranks of management students now generate substantial grants, these resources are not necessarily channelled back to business faculties....
>
> Now, total enrolment is levelling off or declining, and financial retrenchment has been instituted by nearly all provincial governments. Universities, whose budgets in real terms are shrinking, cannot easily reassign finances on a reasonable scale to growth areas, even if they perceive the need for it. However, ... many in the university community are not convinced that such a shift of resources is desirable or necessary, judging the popularity of professional disciplines to be cyclical.[22]

It is becoming increasingly evident that because of the state of management education the Canadian economy is entering the 1980s at a severe disadvantage in this field, a circumstance that has changed little over the last decade. For example, in a 1971 Economic Council report, Dr. von Zur-Muehlen called the relative neglect of management education and training "regrettable when the preconditions for economic development in Canada depend to a large extent on the availability of highly trained managerial capabilities and know-how."23 The Consultative Group believes that this statement is equally applicable today, but that the condition of management education is developing to crisis proportions.

Table 1. Full-time Undergraduate Enrolment in Management and Administrative Studies, 1970-71 to 1979-80

	Management and administrative studies	Total undergraduate enrolment (all faculties)	Percent of total
1970-71	16,747	276,297	6.1
1971-72	20,189	287,718	7.0
1972-73	22,266	284,897	7.8
1973-74	25,177	294,976	8.5
1974-75	26,877	309,171	8.7
1975-76	29,752	330,537	9.0
1976-77	32,161	335,866	9.6
1977-78	34,259	333,500	10.3
1978-79*	35,000	326,816	10.7
1979-80*	37,000	321,265	11.5

* - Estimated

Source: Statistics Canada

Table 2. Full-time and Part-time Master's Enrolment in Management and Administrative Studies, by Sex, 1970-71 to 1977-78

	Full-time			Part-time			Total		
Year	Male	Female	Total	Male	Female	Total	Male	Female	Total
1970-71	2,069	73	2,142	1,370	40	1,410	3,439	113	3,552
	(96.6)	(3.4)	(100.0)	(97.2)	(2.8)	(100.0)	(96.8)	(3.2)	(100.0)
1971-72	2,050	96	2,146	1,586	56	1,642	3,636	152	3,788
	(95.5)	(4.5)	(100.0)	(96.6)	(3.4)	(100.0)	(96.0)	(4.0)	(100.0)
1972-73	2,170	111	2,281	1,536	68	1,604	3,706	179	3,855
	(95.1)	(4.9)	(100.0)	(95.8)	(4.2)	(100.0)	(95.4)	(4.6)	(100.0)
1973-74	2,275	205	2,480	1,529	132	1,661	3,804	337	4,141
	(91.7)	(8.3)	(100.0)	(92.1)	(7.2)	(100.0)	(91.9)	(8.1)	(100.0)
1974-75	2,146	290	2,436	1,516	157	1,673	3,662	447	4,109
	(88.1)	(11.9)	(100.0)	(90.6)	(9.4)	(100.0)	(89.1)	(10.4)	(100.0)
1975-76	2,407	413	2,820	2,112	283	2,395	4,519	696	5,215
	(85.4)	(14.6)	(100.0)	(88.2)	(11.8)	(100.0)	(86.7)	(13.3)	(100.0)
1976-77	2,375	493	2,868	3,493	405	2,898	4,869	898	5,769
	(82.8)	(17.2)	(100.0)	(86.0)	(14.0)	(100.0)	(84.4)	(15.6)	(100.0)
1977-78	2,547	536	3,083	2,362	493	2,855	4,909	1,029	5,938
	(82.6)	(17.4)	(100.0)	(82.7)	(17.3)	(100.0)	(82.7)	(17.3)	(100.0)

Percentage in brackets indicates breakdown by sex

Source: Statistics Canada

Table 3. MBA Degrees Granted Compared with Total Master's Degrees Granted, by Sex, 1970-71 to 1977-78

	MBA						All master's degrees		
	Male	% of male master's	Female	% of female master's	Total	% of total master's	Male	Female	Total
1970-71	1,022 (98.6)	13.6	15 (1.4)	0.7	1,037 (100.0)	10.8	7,493 (78.0)	2,116 (22.0)	9,609 (100.0)
1971-72	1,112 (96.8)	14.4	37 (3.2)	1.4	1,149 (100.0)	11.2	7,725 (75.2)	2,552 (24.8)	10,277 (100.0)
1972-73	1,195 (96.4)	15.4	45 (3.6)	1.6	1,240 (100.0)	11.7	7,757 (73.2)	2,846 (26.8)	10,603 (100.0)
1973-74	1,201 (94.2)	16.2	74 (5.8)	2.7	1,275 (100.0)	12.5	7,426 (72.8)	2,770 (27.2)	10,196 (100.0)
1974-75	1,415 (91.1)	17.8	139 (8.9)	4.4	1,554 (100.0)	14.0	7,950 (71.8)	3,118 (28.2)	11,068 (100.0)
1975-76	1,408 (87.1)	17.6	208 (12.9)	5.9	1,616 (100.0)	14.0	8,030 (69.5)	3,525 (30.5)	11,555 (100.0)
1976-77	1,487 (86.0)	17.5	242 (14.0)	6.2	1,729 (100.0)	14.0	8,498 (68.7)	3,877 (31.3)	12,375 (100.0)
1977-78	1,453 (84.0)	17.1	277 (16.0)	6.7	1,730 (100.0)	13.7	8,486 (67.2)	4,151 (32.8)	12,637 (100.0)

Percentage in brackets indicates breakdown by sex.

Source: Statistics Canada

Table 4. Ph.D. Degrees Granted in Management and Administrative Studies, by University, 1970-71 to 1977-78

University	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78*
Laval	-	-	-	-	1	1	3	
McGill	-	-	-	1	-	1	-	
Toronto	-	-	1	1	6	3	1	
Waterloo	-	-	1	-	-	-	-	
Western	4	6	7	4	5	4	2	
York	-	-	-	2	-	-	-	
U.B.C.	-	-	1	2	7	3	4	
Total	4	6	10	10	19	12	10	19

* - Institutional breakdown not available.

Source: Statistics Canada

Table 5. Full-time Community College Enrolment in Management Programs, 1974-75 to 1978-79

Academic year	Enrolment in management programs	Percent of total enrolment	Enrolment in secretarial programs	Percent of total enrolment	Subtotal	Percent of total enrolment	Total enrolment
1974-75	28,460	21.6	7,660	5.8	36,120	27.4	131,968
1975-76	30,415	21.6	9,091	6.4	39,506	28.0	140,846
	(6.9)		(18.7)		(0.4)		(6.7)
1976-77	33,164	22.8	9,984	6.8	43,148	29.6	145,669
	(9.3)		(9.8)		(9.2)		(3.4)
1977-78	37,489	24.5	11,243	7.4	48,732	31.9	152,664
	(13.0)		(12.6)		(12.8)		(4.8)
1978-79	40,629	25.3	12,000	7.5	52,629	32.8	160,724
	(8.4)		(6.7)		(8.0)		(5.3)

Percentage increase over previous year in brackets

Source: Statistics Canada

Table 6. A Comparison of Bachelor's Degrees Granted in Management and Administrative Studies at Canadian and American Universities, 1970-71 to 1975-76

	CANADA		UNITED STATES		
	Number of bachelor's degrees granted	Number of graduates per 1000 population in 20-24 age group	Number of bachelor's degrees granted	Number of graduates per 1000 population in 20-24 age group	Ratio of U.S. graduates per 1000 population to Canadian graduates per 1000 population
1970-71	3,345	1.770	115,527	6.55	3.70
1971-72	3,656	1.870	121,830	6.87	3.67
1972-73	3,965	2.033	132,330	7.31	3.60
1973-74	4,604	2.266	135,360	7.31	3.23
1974-75	5,246	2.473	133,822	7.04	2.85
1975-76	5,983	2.720	143,436	7.38	2.71

Source: Adapted from Foster Research, Requirements for Postgraduate Management Programs at the University of Calgary (prepared for the Calgary Chamber of Commerce and the Management Advisory Council, Faculty of Management, University of Calgary) January 1979. (by permission)

Table 7. A Comparison of Master's Degrees Granted in Management and Administrative Studies at Canadian and American Universities, 1970-71 to 1975-76

	CANADA		UNITED STATES		
	Number of master's degrees granted	Number of graduates per 1000 population in 20-24 age group	Number of master's degrees granted	Number of graduates per 1000 population in 20-24 age group	Ratio of U.S. graduates per 1000 population to Canadian graduates per 1000 population
1970-71	1,092	0.314	26,544	0.843	2.68
1971-72	1,135	0.314	29,690	0.915	2.91
1972-73	1,234	0.331	30,230	0.900	2.72
1973-74	1,275	0.328	31,370	0.905	2.76
1974-75	1,633	0.402	36,364	1.014	2.52
1975-76	1,616	0.386	42,620	1,147	2.97

Source: Adapted from Foster Research, Requirements for Postgraduate Management Programs at the University of Calgary (prepared for the Calgary Chamber of Commerce and the Management Advisory Council, Faculty of Management, University of Calgary) January 1979. (by permission)

Table 8. Probable Major of First Year Enrolment at American Universities, 1970 to 1977 (in percentages)

	1970	1971	1972	1973	1974	1975	1976	1977
Arts and Humanities	15.7	14.3	14.0	11.0	10.6	9.3	9.3	8.8
Social sciences	8.9	8.6	7.8	6.6	6.8	6.2	5.6	5.4
Education	11.6	9.9	7.3	12.2	10.5	9.9	9.3	8.8
Business	16.2	16.4	15.5	17.7	17.9	18.9	20.9	22.2
Mathematics and Physical sciences	5.6	4.7	4.1	4.4	4.0	3.8	3.7	3.1
Engineering	8.6	7.2	6.9	6.6	6.6	7.9	8.5	9.3
Biological sciences	3.5	3.6	3.9	7.0	6.7	6.3	6.2	4.7

Source: The American Freshmen: National Norms for Fall 1977, by A.W. Astin, M.R. King, and G.T. Richardson (Los Angeles: Graduate School of Education, University of California, Los Angeles, 1978).

Table 9. Number of Full-time University Teachers in Management and Administrative Studies, 1970-71 to 1979-80

	Management and administrative studies	Percentage of all full-time university teachers	Total all disciplines
1970-71	712	2.9	24,604
1971-72	923	3.4	26,963
1972-73	952	3.4	27,870
1973-74	1,051	3.7	28,539
1974-75*	1,227	4.1	29,710
1975-76	1,273	4.1	30,784
1976-77	1,374	4.4	31,460
1977-78	1,432	4.5	32,167
1978-79**	1,500	4.6	32,553
1979-80**	1,565	4.8	32,480

* - Includes for the first time faculty from Ryerson Polytechnical Institute

** - Estimated

Source: Statistics Canada

Table 10. Type and Place of Employment of Ph.D. Graduates in Management and Administrative Studies from the Universities of Toronto, Western Ontario and British Columbia

Ph.D. Origin	University employment		Non-university employment		Subtotal		Total
	Canada	Outside Canada	Canada	Outside Canada	Canada	Outside Canada	
Toronto*	12(75.0)	4 (25.0)	-	-	12(75.0)	4 (25.0)	16(100.0)
Western Ontario	33(73.3)	3 (6.7)	7(15.6)	2 (4.4)	40(88.9)	5 (11.1)	45(100.0)
British Columbia	19(73.1)	4 (15.4)	1(3.8)	2 (7.7)	20(76.9)	6 (23.1)	26(100.0)
Total	64(73.6)	11 (12.6)	8(9.2)	4 (4.6)	72(82.8)	15 (17.2)	87(100.0)

* Two Ph.D. graduates unspecified.

Source: Consultative Group on Research and Graduate Education in Business, Management and Administrative Studies

Table 11. Doctoral Degrees in Management and Administrative Studies Granted in Canada Compared with the United States, 1970-71 to 1979-80

Year	Canada	United States	American total (prorated on a population ratio of 10:1)	Canadian total as percent of American prorated total
1970-71	4	810	81	4.9
1971-72	6	900	90	6.7
1972-73	10	1,010	101	9.9
1973-74	10	1,120	112	8.9
1974-75	19	1,011	101	18.8
1975-76	12	956	96	12.5
1976-77	10	950	95	10.5
1977-78	19	925	92	20.6
1978-79*	15	900	90	16.7
1979-80*	20	900	90	22.2
10-year total	125	9,482	948	13.2

* Estimated

Source: Statistics Canada

Table 12. Doctoral Fellowships by the Social Sciences and Humanities Research Council to Management and Administrative Studies Students, 1970-71 to 1978-79

	Doctoral fellowships in management and administrative studies	Success ratio of applicants (percent)	Total number of doctoral fellowships	Percentage in management and administrative studies
1970-71	64	30.1	2,456	2.5
1971-72	68	29.0	2,395	2.8
1972-73	47	39.0	1,995	2.4
1973-74	36	35.1	1,722	2.1
1974-75	29	26.5	1,523	1.9
1975-76	21	32.3	1,387	1.5
1976-77	21	35.0	1,340	1.4
1977-78	27	38.0	1,327	2.0
1978-79	22	37.0	1,198	1.8

Source: Annual Reports of the Canada Council and SSHRCC data.

Table 13. Anticipated Net Additions and Replacement Demand for Management and Administrative Studies Faculty, 1979-80, by Region

Region	Net additions (growth)	Replacement demand	Total
Atlantic Provinces	9	32	41
Quebec	35	25	60
Ontario	25	45	70
Western Provinces	9	53	62
Total	78	155	233

Source: Telephone survey of 40 management and administrative studies schools in March and early April, 1979.

CANADIAN MANAGEMENT RESEARCH

In 1968 the Fifth Annual Review of the Economic Council concluded, "In our view, no task may be more important for improving Canada's innovative performance than to strengthen the capabilities of Canadian management to understand and manage technological change and the innovative process." While there were many routes to that end, they observed, "One of the most rewarding is likely to be improvement in management education and training, both through strengthening university business education in Canada, and through facilitating Canadian management training on a continuing basis." Along with these actions, "there should be an expansion of university-based business research, as well as greater attention to improved systems of management development in Canadian corporations, governments and institutions."[24]

Seven years later, the Commission on Canadian Studies found a "...relative neglect of writing and research of special relevance to Canada in the business and management field.... In correspondence with the Commission, several deans of schools of business studies expressed concern about the lack of research, of textbooks and of scholarly publications dealing with Canadian topics and situations".[25]

Most research had been done in other countries, and the results had been used here on the assumption that they were valid in the Canadian milieu. "But the fact is, there are enough differences in the make-up, attitudes and culture of the Canadian people to warrant Canadian research."[26]

Issues that the Commission pointed out as needing investigation included: the origins of business activity in Canada; the impact of the social structure on productivity; Canadian business ideology; management of Canadian multi-national firms; the impact of American subsidiaries; problems of small Canadian firms; and behavioural questions such as on-the-job performance. The Commission concluded that "research programs at Canadian business schools need to place more emphasis both on Canadian problems, practices and institutions and on those of countries other than the United States. While the study of American practices and techniques, particularly in the quantitative areas, has been and can continue to be very helpful, it is not enough simply to adapt these to Canadian circumstances."[27] Many briefs to the Commission made a related point: "Lack of research funds and indifference shown by award-granting agencies towards business studies are a major obstacle to progress..."[28]

The Task Force on Business-Government Interface[29] concurred with the Commission's judgments about the serious paucity of research, and recommended promotion of more Canadian studies by universities and other third-party organizations, to be supported by both business and government.

Ironically, the management faculty rate research of great importance to their work. In a recent study by Slavek J. Hurka, a random sample of 322 faculty teaching in 15 Canadian universities were asked to rank various aspects that made their job satisfying. The top seven characteristics were: time and facilities to do quality research; opportunity to work with supportive colleagues; bright and stimulating students; salary; opportunity to be a good

teacher; a dean who lets me define my own responsibilities and fulfil them in my own way; and adequate library facilities.[30] The other 14 characteristics listed came far behind. However, respondents were least satisfied with those conditions they felt to be most important. The number one attribute of an ideal position, time and facilities to do quality research, ranked 20th (of 21 items) in satisfaction. More than a third of the respondents found their present situation less than "barely satisfactory" in this regard. Working with supportive colleagues ranked second in importance but the mean satisfaction score was a low 15th. Heavy teaching loads may have been responsible for this discontent.

But despite these problems, most large Canadian management schools engage in a certain amount of research, and the better ones compare very favourably with prestigious American universities. A study by Mark Thompson and Vance F. Mitchell examined the relative performance of Canadian and U.S. management schools' faculty in publishing in American journals, and concluded that five Canadian institutions are among North America's leading business schools in their publishing success rate.[31]

RESEARCH FUNDING

The Social Sciences and Humanities Research Council of Canada (SSHRCC) and the Natural Sciences and Engineering Research Council (NSERC) have both funded academic research by management faculty. In this decade only 170 applications to the SSHRCC for research grants in management have been made, 88 of which were funded (a success ratio of 51.8%) (Table 14). A study by Donald M. Caskie indicated that between 1973-74 and 1976-77 applications in the category "Administrative Studies" had a success rate of 48.5%, compared with an overall average of 70.5%.32 Of the $21,154,891 granted in that four-year period, $441,361, or about 2%, was awarded in Administrative Studies. Caskie suggested that management faculty made relatively few applications (about 2.2% of total), because only a small proportion are interested and experienced in the particular type of scholarly research favoured by the SSHRCC. He speculated that the situation would improve as young doctoral graduates entering the profession fresh from their thesis and wishing to continue their research apply to the SSHRCC. But in fact, in the two years since Caskie's study, applications have dropped sharply - only 13 last year (that is, fewer than 1% of all management faculty applied).33 A number of reasons might be suggested for these low rates: management studies' poor history of success; opportunities for contract research in government and industry; the long waiting period in the SSHRCC granting process compared with other sources; heavy teaching demands, especially on new faculty preparing courses for the first time; and a prevailing mood of discouragement and disillusionment with the criteria of selection and the granting process.

The NSERC funds management research projects primarily in three categories: Pure and Applied Mathematics; Computing and Information Science; and Engineering- Industrial. A study by Alf Chaiton, updated to 1978-79, showed that over the four-year period, 1975-76 to 1978-79, NSERC awarded $811,033 to management faculty (Table 15). This is about $370,000 more than the SSHRCC granted during the four-year period studied by Caskie.34 There were 145 management applications, 126 of which were accepted (a success rate of 86.9%, compared with the average of 91.6%).

In her study, Research Programs of University Management Schools in the Late 1970s, Anne Scotton has calculated that 1977-78 research expenditures at management schools were $4.6 million, nearly all of which was from Canadian sources.35 The SSHRCC provided about 1% and the NSERC about 5%, together around 6% of all research funding. Comments by respondents to the survey indicated that many had difficulty obtaining assistance, particularly schools outside central Canada, and especially in the Atlantic region. Many felt that the federal granting agencies, especially the SSHRCC, did not consider Management and Administrative Studies to be an "academic" activity. This lack of regard, they believed, reflected domination of the agencies by faculty from the more traditional disciplines.36

The nature of research in a professional field such as management studies presents a problem to the granting agencies.37 A sharp distinction is usually made by the SSHRCC between "pure" and "applied" research, a distinction that the Consultative Group does not believe is warranted or productive, although there are important differences in approach.[38]

According to international scholarly standards, "pure" research involves cognitive relationships only, that is, the establishment of basic laws. "Applied" research deals with both relationships and their practical utility. As such, most research in the social sciences and humanities is, to some extent, "applied".

The Consultative Group sees a management school as a focus of applied social and other sciences in much the same way that engineering is related to the natural sciences, or medicine to the health sciences. Such a role is no source of weakness or embarrassment. In his book Academic Strategy, L.T. Hosmer studied three business schools, and argued that they were not fulfilling their objectives, largely because they had subverted their original aims in order to gain academic respectability; in other words, they were becoming too traditional. Management studies is not a traditional social science, nor should it be.

A related question has been the effect of consulting activity undertaken by the faculty on the quality of research at management schools. According to Scotton's study, consulting is most prevalent in Ontario and Quebec; considerably less so in the Atlantic and Western regions. The main reason is that the vast majority of head offices of the larger companies, as well as the two largest provincial governments and the federal government, are located in Ontario and Quebec. Being away from the centre of economic activity means far fewer opportunities for consulting and contract research. However, there does not appear to be any negative correlation between the amount of consulting and research productivity. On the contrary, indications are that many consultants are among the best researchers in the country. The reason is that for these faculty, consulting and contract research are a "laboratory" where they keep in touch with the public and private organizations, and maintain a feel for real problems. In fact, a large number of faculty regard the lack of time for consulting as a major disadvantage. The Consultative Group believes that there should be a creative tension between research and consulting. Too much emphasis on one leads to irrelevance, too much on the other, to a trade school.

Another contentious issue is case research. In his 1977-78 Annual Report, Derek Bok, President of Harvard University, suggested that further discussion was needed to obtain a clearer understanding of the appropriate use of the case method in research and teaching. In Canada, an estimated 80% of management faculty make some use of the case method in one way or another in their teaching. It is important, however, to differentiate between case writing and case research. According to C.B. Johnston, Dean of the Faculty of Business Administration at the University of Western Ontario (where the case method forms the basis of their approach), a teaching case confronts the student with a real problem that an actual manager has faced in the past. The student must analyze the situation and recommend appropriate action. The prime purpose is to develop analytical and decision- making skills.

Case research, on the other hand, deals with detailed descriptions of clinical situations from which some inferences can be drawn and alternatives developed. The result may be greater insight into the nature of the problem, generation of hypotheses for further testing with other methodologies, or concept formulation as a foundation for further investigation.

The shaping of modern case research is often done with an eye to the possible application and extension of theoretical and conceptual frameworks emerging in the underlying social science disciplines. It is part of the total research process in management studies.39

A principal problem with management research is the lack of faculty time. There is certainly need for more funding, but if the pressures of teaching were decreased, the quantity and quality of research would probably increase significantly. The Leave Fellowships Program of the SSHRCC gives faculty an opportunity to concentrate on research for a period. However, over the past decade only 38 awards have been granted in management studies. Table 16 shows that during the 1970s the success rate for management applications was consistently lower than that of faculty in other disciplines. In 1977-78, for example, three leave fellowships (20.0% success rate) were awarded to management faculty, amounting to a total of $32,400, but there were 42 awards in Economics (63.6%; $453,500), 41 in History (50.0%; $442,700), 69 in Language and Literature (47.6%; $745,200), 32 in Political Science (65.3%; $345,500), 26 in Psychology (61.0%; $388,700), and 21 in Sociology (39.6%; $226,700). Overall that year, 370 awards were made for a total of $3,995,000, with an average success rate of 46.4%.[40]

Table 14. Research Grants by the Social Sciences and Humanities Research Council to Management and Administrative Studies Faculty, 1970-71 to 1978-79

	Applications	Awards	Success ratio	Percentage of management and administrative studies faculty who applied	Percentage of total human sciences faculty who applied
1970-71	12	9	75.0 (84.0)	1.7	8.2
1971-72	8	5	62.5 (83.2)	0.9	6.7
1972-73	8	6	75.0 (76.2)	0.8	7.3
1973-74	16	8	50.0 (70.8)	1.5	8.1
1974-75	15	4	26.7 (65.6)	1.2	8.2
1975-76	42	22	52.4 (68.3)	3.3	6.6
1976-77	38	15	37.5 (67.9)	2.8	5.2
1977-78	18	10	55.6 (69.9)	1.2	6.3
1978-79	13	9	69.2 (78.0)	0.9	4.0

Percentage in brackets shows the success ratio for all disciplines in the human sciences (education, fine and applied arts, humanities, and social sciences).

Sources: Annual Reports of the Canada Council and SSHRCC data.

Table 15. Research Grants by the Natural Sciences and Engineering Research Council to Management and Administrative Studies Faculty, 1975-76 to 1978-79.

	Number of applications	Number of awards	%	% of total applications	% of total awards	Amount awarded (in $)	% of total amount awarded
1975-76							
Management	25	21	84.0	0.4	0.6	110,250	0.2
Total(all disciplines)	5,638	5,124	90.9	100.0	100.0	48,880,392	100.0
1976-77							
Management	34	31	91.2	0.6	0.6	176,784	0.3
Total(all disciplines)	5,716	5,174	90.5	100.0	100.0	51,295,114	100.0
1977-78							
Management	42	37	88.1	0.7	0.7	257,866	0.5
Total(all disciplines)	5,695	5,169	90.8	100.0	100.0	56,977,677	100.0
1978-79							
Management	44	37	84.1	0.8	0.7	266,133	0.4
Total(all disciplines)	5,735	5,227	91.1	100.0	100.0	62,789,951	100.0
TOTAL							
Management	145	126	86.9	0.6	0.6	811,033	0.4
Total(all disciplines)	22,584	20,694	91.6	100.0	100.0	219,943,134	100.0

Source: National Research Council and NSERC data

Table 16. Leave Fellowships by the Social Sciences and Humanities Research Council to Management and Administrative Studies Faculty, 1970-71 to 1978-79

	Applications	Awards	Success ratio	Percentage of management and administrative studies faculty who applied	Percentage of total human sciences faculty who applied
1970-71	4	1	25.0 (60.7)	0.6	1.9
1971-72	2	1	50.0 (60.7)	0.2	2.8
1972-73	2	1	0.0 (62.6)	0.2	3.2
1973-74	11	4	36.4 (54.1)	1.0	4.1
1974-75	23	12	52.2 (48.9)	1.9	4.7
1975-76	26	6	23.1 (41.0)	2.0	4.8
1976-77	16	4	25.1 (46.8)	1.2	4.5
1977-78	15	3	20.0 (46.4)	1.0	4.3
1978-79	29	7	33.3 (43.4)	1.5	4.6

Percentage in brackets shows the success ratio for all disciplines in the human sciences (education, fine and applied arts, humanities, and social sciences).

Sources: Annual Reports of the Canada Council and SSHRCC data.

RECOMMENDATIONS

A number of points have been emphasized in preceding sections:

- Canada's need has never been greater for better managers and more effective management and decision-making in both the public and private sectors.

- The above notwithstanding, Canada's universities are not devoting a large enough share of their total resources to management education.

- Partly because of their relative underfunding, but also because of a lack of sufficient numbers of qualified staff, Canada's faculties of Management and Administrative Studies cannot provide a high quality education to all of those students interested in obtaining such an education.

- The combination of staff shortages and growing enrolments make it impossible for overloaded professors of management to carry out the amount of research in management that should be conducted and that these staff members wish to conduct.

- The demonstrated performance of the SSHRCC and its predecessor agency as well as the norms and criteria which have traditionally governed these organizations suggest to the Consultative Group that Management and Administrative Studies is unlikely to receive in the future an appropriate share of total SSHRCC attention and resources, relative to the developmental task at hand.

All the problems of management education are not, of course, the legitimate concern of a federal granting agency primarily concerned with graduate education and research. Since education is a provincial responsibility, any direct federal intervention into the manner in which universities allocate their resources among claimant faculties is impossible. Consequently, there is very little that SSHRCC or any similar body can do about the fact that Canada's faculties of Management and Administrative Studies require upward budgetary adjustments of 25% to 50% to perform properly their twin missions of education and research. (Hopefully, Canada's universities will at long last move to reallocate their resources internally before provincial governments might undertake that task for them.) Similarly, the essentially professional nature of the MBA degree suggests that student support at the MBA level is not a legitimate concern of present federal granting agencies.

Our review of the issues that should be of concern to a federal granting agency has led us to make four recommendations whose acceptance and implementation appears essential:

- the designation of management education and research as a priority national concern of federal granting agencies, to be funded with a strategic grant of approximately three million dollars a year (in 1980 dollars).

- a series of actions along a number of lines to alleviate the existing shortage of fully qualified teaching staff in Management and Administrative Studies.

- a multi-faceted effort to improve the research output of Canada's professors of Management and Administrative Studies.

- the establishment of a Management Research Council, modelled, in terms of its professional concern, after the Medical Research Council, to assume responsibility for the administration of all those programs associated with management education and research being designated a priority national concern.

Each of these recommendations is discussed in the remainder of this section.

Management as a Priority National Concern

Given the developing crisis in management education and research, this field deserves far more support and attention from a variety of different sources than it has received to date. A necessary first step in gaining such support and attention is official designation of the area as a priority national concern by federal granting agencies. We would then anticipate action consistent with that designation from such bodies. Equally important, action at the provincial level should also ensue, with governments, universities and the business community taking appropriate steps.

Designation of management education and research as a priority national concern should be accompanied by a strategic grant - or otherwise designated level of support - of approximately three million dollars a year. We conservatively estimate this amount as the minimum required to deal with the staff development and research programs outlined below.

Alleviating the Shortage of Teaching Staff

Over the next decade, Canada's faculties of Management and Administrative Studies will require more than 500 additional staff members possessing a Ph.D. degree.[41] We have already shown that much of this increase in staff is required merely to restore student/teacher ratios in Management and Administrative Studies to more reasonable levels, and to replace less qualified staff members holding temporary appointments, both on a full-time and part-time basis. Recognition of management education and research as a priority national concern means, first and foremost, a concerted program to deal with this staffing problem. The major components of such a program would include the following:

a) Establishment of a Management and Administrative Studies Doctoral Grants Program Sufficient to Support at any Time 100 Students a Year at an Annual Rate, in 1980 Dollars, of $12,000 Per Year.

Such a program, when fully implemented, would be assisting in the education of 30 to 35 graduating students a year, students who would have their choice of a large number of professionally challenging positions. Given the existence of such a program of fellowship support, we foresee no difficulties in the various Canadian doctoral programs generating a much larger pool of qualified applicants, from whom each year's group of Doctoral Grant winners could be selected. The availability of both substantial Fellowship funding and good employment prospects upon graduation would provide inducements that could be called to the attention of students enrolled in this country's various MBA programs, as well as from other disciplines.

b) Establishment of a Special Doctoral Awards Program for Management Faculty Members.

A number of management faculty, particularly in the Atlantic region and at smaller universities throughout Canada, have found it impossible to pursue Ph.D. programs; others have completed their course work but not their dissertations. This situation calls for a special program designed to provide such individuals with an opportunity to complete the requirements for the Ph.D. The university involved should be prepared to offer one to two years of educational leave and whatever degree of financial support can be made. In addition, Management and Administrative Studies Doctoral Awards of $12,000 a year should be available to faculty members with at least two or three years of service, who are interested in completing the requirements for a Ph.D. Although our figure is only an estimate, we believe that up to thirty professors a year could be eligible to receive such awards over the life of this program.

c) Establishment of a Special Program For Faculty Members and Recent Doctoral Graduates in Other Disciplines who Wish to Retrain and Reorient Themselves as Professors of Management and Administrative Studies.

Faculty members and recent graduates in certain branches of Mathematics, Computer Science, Psychology, Sociology, Economics, and other disciplines, if carefully selected and properly retrained, could become valuable additions to the teaching staff of a Faculty of Management and Administrative Studies. Of course, only a relatively few individuals from each of these areas would be suitable. We must guard against making management schools homes of last resort for the less successful faculty members in other disciplines or for the doctoral output of those disciplines. Nevertheless, both parties could benefit from reorienting of carefully chosen individuals following a one to two year course of study prescribed for them in advance with due regard for their existing strengths and weaknesses by a sponsoring school of management. Post-doctoral grants of $12,000 a year, in 1980 dollars, should also be available for such individuals. Such a program is not without precedent. A

similar undertaking in the United States is under consideration by the National Science Foundation, and already sponsored by the National Endowment for the Humanities and the Ford Foundation. We estimate that up to 20 Canadian scholars each year might be enrolled in such a program.

The staffing problems of Canadian faculties of Management and Administrative Studies could also be partially alleviated by more effective exchange programs with the private and public sectors. Such programs, however, would appear to fall primarily outside the scope of the SSHRCC or any successor granting agency. In contrast, the three-pronged attack of increased doctoral support for new Ph.D. candidates, completion grants for management professors without Ph.D.'s, and the reorientation of those trained in other disciplines definitely merits granting agency support. The annual cost of all three programs, if conducted at the anticipated level, would be $1,800,000 a year.

Increased Investment in Management Research

Additional support for management research is the other form in which designation of Management and Administrative Studies as a national priority fo federal granting agencies should manifest itself. A necessary first step in this direction involves recognition that a wide spectrum of activities differin greatly in nature and scope can qualify as legitimate and supportable research in the area of Management and Administrative Studies. Ranging from the highly abstract to the highly clinical, from complex mathematics to behavioural psychology, including "the pure" and "the applied", macro-issues and micro-concerns, prescription and description, empirical investigation and methodological development - all these very different, contrasting activities are suitable areas of inquiry and/or tools of analysis. Given the eclectic nature of this developing field of study, we have concluded that any effort to support research in Management and Administrative Studies should cover the full range of research activities. Management research is a highly complex, multi-disciplinary field that cannot be defined in a uni-dimensional way. At present, no federal granting agency has an orientation appropriate to the total concept of management research.

What must govern in the granting of research funds is, of course, the assessment of peers, from the applicant's own discipline, who have been charged with evaluating each project in terms of its conceptual and methodological soundness and its potential research contribution to that discipline. Consideration should be given to following the Natural Sciences and Engineerin Research Council pattern of establishing fixed panels, in finance, marketing, accounting and the like, to review all grant applications in those fields. Evaluation by carefully selected and widely respected jury members whose own past research achievements and demonstrated personal commitment to management research are beyond question would go a long way toward greatly increasing the number of applications submitted by management faculty.

Also facilitating the research effort would be widespread advertising of the fact that a substantial amount, initially in the vicinity of $500,000 a year, had been designated as "earmarked" for management research. A program o "starter" grants of modest size being made available to junior faculty, without excessive screening, also seems desirable.

Research Support - Other Dimensions

A number of other research-related issues should also be mentioned.

a) The recent hiring pattern of Canadian faculties of Management and Administrative Studies and the qualifications of those most recently hired combine to suggest that in the very near future some 80 to 100 applications a year for Leave Fellowships or their equivalent can be expected from management faculty. Once management research has been designated as a priority national concern, it would make sense to provide the desired funding to every management professor whose submission contains a carefully formulated research project. If only half of the applicants meet this test and are judged by members of their own discipline as worthy of support, the annual financial commitment for this type of Research Fellowship would be in the vicinity of $500,000.

b) More attention and money must be directed to management research topics of particular concern to Canada. There is a need to establish a distinctive Canadian identity, unique both in content and technique, in some of the functional areas of management. An even greater need exists for a range of suitable outlets for research that focuses on Canadian problems and that, therefore, is unlikely to be published in the prestigious international, mainly U.S., journals. The continued existence and further development of Canadian management journals should be supported financially by federal granting agencies. More specifically, the Consultative Group believes that a need may exist for a major interdisciplinary journal, Canadian Management and Administrative Studies, covering all sub-disciplines and appealing to a wide spectrum of interests.

c) A reprint series of the best articles written by Canadian faculty is also necessary. In addition, the papers presented at the annual conference of the Administrative Sciences Association of Canada should be published in a format similar to the Canadian Historical Association's Historical Papers Series. Certain of these papers should then be selected for distribution throughout both the academic and business communities. At the very least, the titles of all articles published, and of all working papers prepared, at each university should be compiled for presentation to, and eventual dissemination by, the appropriate ASAC division.

d) Finally, a number of steps should be taken to upgrade the methodological skills and research "know-how" of management faculty. Research methodology workshops, of the type previously proposed by Professor Ronald Burke of York University,[42] would help to strengthen the skill base of motivated faculty members. An attractive alternative to such summer programs involves the financing of release time for selected faculty to take courses in management research methodology of the type taught at the University of British Columbia by Dr. Richard Mattessich. Special symposia and lecture tours by visiting professors with strong and specialized research interests would also be of particular benefit to regions outside central Canada and to smaller universities everywhere. Finally, a research booklet or newsletter which reported on sources of funding, criteria being used by various granting agencies, types of research supported, etc., would be especially helpful.

We estimate the total annual cost of the research program outlined abo at approximately $1,200,000. Up to half of this amount might eventually be required for the Research Leave program and the remainder for other forms of research support. Such a sum is modest, but is still large enough to make a significant contribution to strengthening the management research output of Canadian faculties of Management and Administrative Studies. Combined with t other proposals for increasing the number of Canadian Ph.D.'s, such a program would go a long way toward resolving the developing crisis in management education and research.

Establishment of a Management Research Council

The Consultative Group has reached the conclusion that the SSHRCC sho probably not be expected to serve as the appropriate federal granting agency management education and research. Analysis of past performance of the SSHR and its predecessor agency suggests a reluctance to support academics and doctoral candidates in Management and Administrative Studies, which is perhap understandable given that its orientation is not directed toward applied research and professional education.

We believe that management education and research would be better serv by a Management Research Council. Such a Council would be charged with supporting a complex of related disciplines as is the case with the Medical Research Council. This new Management Research Council would have a membersh and advisory board that should be both familiar with the problems of manageme education and research and committed to their advancement. It should work wi the Administrative Sciences Association of Canada and the Canadian Federation Deans of Management and Administrative Studies in the selection of qualified evaluators of doctoral dossiers and of research proposals who would have the confidence of management faculty throughout Canada. Those evaluating MBA students seeking Ph.D. support would realize that such applicants can be no l deserving of a doctoral award even though their Master's degree, by design an for good reason, is not a research degree and does not necessarily build upon related undergraduate foundation. The new Council's administration would be lean one, thoroughly familiar with the various management disciplines and trained, perhaps even through prior business school exposure, in methods of making the processing of awards faster, more efficient, and less costly.

It is legitimate to question whether another granting agency, with the additional segmentation that this implies, is really necessary. We believe i is necessary. As it is now operating, the SSHRCC does not meet the legitimat needs of management education and research. The type of SSHRCC restructuring that the Consultative Group would consider necessary also seems unlikely. Barring any future developments, a Management Research Council appears essential.

In summary, then, we recommend that:

1) Management education and research be designated a priority national concern by federal granting agencies and, as such, be the recipient of a strategic grant of $3,000,000 per year (in 1980 dollars).

2) Approximately $1,800,000 of this amount be designated for a variety of programs to increase the number of Ph.D.-qualified professors teaching in Canadian faculties of Management and Administrative Studies.

3) Approximately $1,200,000 a year be available to support the research efforts of Canada's professors of Management and Administrative Studies.

4) The administration of these two strategic grant programs become the primary concern of a new Management Research Council.

We now respectfully submit these recommendations and this Report to the SSHRCC with the hope that this body will consider our mandate as satisfied and our conclusions as deserving of its support.

FOOTNOTES

1. D.J. Daly, "The Changing Labour Force in Canada", in Harish C. Jain (ed.), Contemporary Issues in Canadian Personnel Administration. Scarborough, 1974, pp. 79-80.

2. Ibid.

3. Economic Council of Canada, The Challenge of Growth and Change, Fifth Annual Review, 1968, pp. 35-36.

4. Ibid., pp. 37-41.

5. Ibid., p. 41.

6. Ibid., pp. 41-44.

7. Ibid., p. 43.

8. Ibid., p. 54.

9. D'Avignon Committee Report, Personnel Management and the Merit Principle. Ottawa, 1978, p. 244.

10. Report of the Royal Commission on Financial Management and Accountability. Ottawa, 1979, p. 28.

11. Max von Zur-Muehlen, A Guide to Business Education Programs at Canadian Universities. Ottawa, 1970, Foreword.

12. Abraham Rotstein and Gary Lax (eds.), Getting It Back. Toronto, 1974, Appendix, p. 301.

13. Report of the Special Committee of the Senate on Science Policy. A Science Policy for Canada. Volume I: A Critical Review: Past and Present, Ottawa, 1970; Volume II: Targets and Strategies for the Seventies, Ottawa, 1972; Volume III: A Government Organization for the Seventies, Ottawa, 1973; Volume IV: Progress and Unfinished Business, Ottawa, 1977.

14. John N.H. Britton and James M. Gilmour, The Weakest Link: A Technological Perspective on Canadian Industrial Underdevelopment. Ottawa, 1978.

15. Ministry of State for Science and Technology, Overview of Research and Development in Canada, Six Background Papers. Ottawa, 1978.

16. Economic Council of Canada, A Time for Reason, Fifteenth Annual Review, 1978.

17. See the submission by the Canadian Federation of Deans of Management and Administrative Studies to the Science Council, "The Technological and Managerial Gaps in Canada". Ottawa, 1978.

18. Max B.E. Clarkson, "A Parasitical Reliance on Imported Skills". The Canadian Business Review, Vol. 6, No. 1, Spring, 1979, pp. 21-22.

19. Quoted in Noah M. Meltz, A National Manpower Strategy for the 1980s: The Role of the Canadian Labour Market. The Canadian Institute of Strategic Studies, Fall Seminar, November 1978, p. 7.

20. As quoted in Maclean's, March 19, 1979, p. 446. A similar shift towards vocationally oriented programs at Canadian Community Colleges is evident.

21. January 15, 1979.

22. Max von Zur-Muehlen, "Canadian University Management Education and Research in a Quandary".

23. Max von Zur-Muehlen, Business Education and Faculty at Canadian Universities. Ottawa, 1971.

24. Economic Council of Canada, A Time for Reason, op. cit., p.54.

25. To Know Ourselves, p. 193.

26. Ibid.

27. Ibid., p. 194.

28. Ibid., p. 193.

29. Department of Industry, Trade and Commerce. Task Force on Business-Government Interface. How to Improve Business-Government Relations in Canada. Ottawa, 1976.

30. Slavek J. Hurka, "Business Faculty in Canadian Universities: Importance and Satisfaction Related to Job Characteristics", The Canadian Journal of Higher Education, vol. VIII-3, 1978, p. 70.

31. Mark Thompson and Vance F. Mitchell, "Canadian Contributions to Business Administration Journals, 1970-1974". Journal of Business Administration, Vol. 8, No. 1, Fall, 1976, p.79.

32. Donald M. Caskie, "Canada Council and Administrative Studies: Funding Patterns in the mid-1970's". Ottawa, 1977, p.31 (Table C-1).

33. Indeed, this drop parallels an overall decline in applications to SSHRCC, from a high of 8.2% in 1974-75 to the past year's 4.0%. This decline is curious considering the general scarcity of research funds for university faculty.

34. Alf Chaiton, "National Research Council Support for University Management Education--A Preliminary Description". Ottawa, 1978, p. 13 (Table 5).

35. Anne Scotton, Research Programs of University Management Schools in the late 1970's. Ottawa, 1978, p. 27.

36. The regional meetings held by Alf Chaiton for the Consultative Group confirmed the existence of these perceptions.

37. Other fields with similar problems within the SSHRCC include law, education, and social work.

38. See the paper by Dr. Richard Mattessich, "On The Essence of Basic and Applied Research in the Administrative and Other Instrumental Sciences", Appendix G of this Report.

39. C.B. Johnston, "Case Writing and Case Research", in Donald M. Caskie and Max von Zur-Muehlen (eds.), Proceedings of the Management Research Workshop, Ottawa, 1978, p. 24.

40. An additional difficulty for many faculty members in Management and Administrative Studies has been the stipulations of the sabbatical agreement that the sabbatical year could not be used to complete their doctoral degree, a process which might have enabled many to improve their research skills.

41. According to a recent telephone survey, there are approximately 100 budgeted, unfilled faculty positions for the academic year 1979-80, due to a shortage of qualified individuals.

42. Ronald J. Burke, "A Potential Model for a Research Methodology Workshop", in Donald M. Caskie and Max von Zur-Muehlen (eds.), Proceedings of the Management Research Workshop, Ottawa, 1978.

Appendix A

TERMS OF REFERENCE OF THE CONSULTATIVE GROUP ON RESEARCH AND GRADUATE EDUCATION IN BUSINESS, MANAGEMENT AND ADMINISTRATIVE STUDIES

1. To define the nature of research in management and administrative studies, especially as it relates to Canadian needs and aspirations; to consider the effects of the discipline's professional status on such research; and to determine whether any general conclusions might be drawn from the review which relate to all professional disciplines.

2. To survey the state of research in management and administrative studies, taking into consideration the amount being carried out, the methods employed, its scope, quality, theoretical perspectives and sources of funding.

3. To examine graduate education in management and administrative studies as it relates to advanced research being carried out by students and professors.

4. To make recommendations to the profession, university faculties and administrations, governments and granting councils aimed at improving scholarship, research and research-related graduate education in management and administrative studies, particularly as they reflect national concerns.

15.2.79

Appendix B

CONSULTATIVE GROUP MEMBERS AND DATES OF MEETINGS

Members

Laurent Picard (Chairman)
Dean, Faculty of Management
McGill University
Montreal

Jacques Bourgeois
Associate Professor
School of Commerce
Carleton University
Ottawa

Richard J. Hand
Vice-Principal (Resources)
Queen's University
Kingston

Josef Kates
Josef Kates Associates Incorporated
Toronto

George S. Lane
Dean
Faculty of Management
University of Calgary

James D. McNiven
Executive Vice-President
Atlantic Provinces Economic Council
Halifax

Richard V. Mattessich
Professor
Faculty of Commerce and
Business Administration
University of British Columbia
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Garfield A. Pynn
Director
P.J. Gardiner Institute for Small
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Memorial University of Newfoundland
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Jean-Marie Toulouse
Professor and Director of Research
Ecole des hautes études commerciales
Montreal

Max von Zur-Muehlen
Coordinator of Research
Education, Science and Culture Division
Statistics Canada
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Associate Members

Allan Blair
Science Adviser
Science Council of Canada
Ottawa

Max B.E. Clarkson
Dean
Faculty of Management Studies
University of Toronto

Staff

Alf Chaiton
Executive Secretary and
Research Associate for the
Consultative Group
Social Sciences and Humanities
Research Council of Canada
Ottawa

Dates of Meetings

March 19, 1979 (Ottawa)

May 29-30, 1979 (Saskatoon)

August 30-31, 1979 (Montreal)

October 1-4, 1979 (Toronto)

Appendix C

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Appendix D

DOCUMENTATION PREPARED FOR THE CONSULTATIVE GROUP

Bourgeois, Jacques. "Some Thoughts on Doctoral Students' Concerns"

Chaiton, Alf. Background Documentation for First Meeting of Consultative Group

Chaiton, Alf. Background Documentation for Second Meeting of Consultative Group

Chaiton, Alf. Background Documentation for Third Meeting of Consultative Group

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von Zur-Muehlen, Max. "M.B.A.'s in Canada"

von Zur-Muehlen, Max. "Ph.D. Programs and Students in Management and Administrative Studies in Canada"

Appendix E

MEMORANDUM OF THE CONSULTATIVE GROUP ON RESEARCH AND GRADUATE EDUCATION IN BUSINESS, MANAGEMENT AND ADMINISTRATIVE STUDIES TO THE SOCIAL SCIENCES AND HUMANITIES RESEARCH COUNCIL

The Consultative Group on Research and Graduate Education in Business, Management and Administrative Studies has instructed me to communicate to the June meeting of the SSHRCC our concern about the crisis which exists in university management education and research. The Consultative Group has identified and defined the dimension of the problem, and has developed a number of possible solutions. A comprehensive treatment will be available in our Interim Report this Fall.

A number of recent Reports (from the Auditor-General, Economic Council, Science Council, Lambert Report, and many others) indicate the critical role that management plays in the Canadian economy. To a large degree, the health of that function depends on the health of university management education and research. The available documentation together with the information and analysis which we have generated demonstrates that university management education and research is facing severe constraints which require an immediate response in the national interest. The attached supporting material and the references identified indicate that immediate action is needed.

As an example, one of the most significant national challenges of the 1980s will be the adaptation of the Canadian economy to the new GATT agreement. In effect, the remnants of the old "National Policy" will be discarded, as will other protectionist devices.

The restructuring of Canadian business institutions and the required improvement in their economic behaviour will place great pressure on management. For instance, the evolution of branch-plant operations under the new tariff regime will be toward significant world product mandating. Instead of producing a wide variety of products for the Canadian market, such businesses will be instructed to produce one or more lines which will then be sold on a world-wide basis. Such a change would require more competent management able to function on a global scale. If this management pool is not forthcoming then American talent will be substituted for it, or the plants will be moved to the U.S. or to countries where the skills are available. It is essential to note that the skill levels are significantly different from those in place today.

Independent Canadian businesses will also be placed under greater pressure as protectionist walls come down. The need for better cost control, marketing and technological development will grow markedly, or these firms will be overwhelmed by foreign competition. There is evidence that federal and provincial programs and funds will be available for upgrading of corporate capabilities, but without the professionals to use these programs and funds, nothing will come of these good intentions.

The GATT agreements will be implemented over the eight-year period beginning January 1, 1980. Within a decade, then, we can expect a fundamental restructuring of the Canadian business complex. If we do not have the people with the necessary skills to provide the necessary conceptualization and manage this massive change, we will lose our present economic status. It is a national concern and should be seen as an emergency situation.

We have noted that your Council responds immediately when the national interest has required a positive intervention. You have already identified a number of national concerns. After completing the documentation phase of our work and as a result of our deliberations, and discussions with experts and interested groups, we concluded that it is in the national interest that university management education and research be identified immediately as a priority concern of your Council, similar to your identification of the two themes "the aging population" and "research resources".

If this contention is supported by the Council at your June meeting, a budgetary allocation should be effected immediately. At this point, we can only give a sense of the minimum resources needed for this fiscal year (1979-80), and the priority items which need funding. Our Interim Report will provide medium-term financial requirements. The enclosure provides an overview of the type of programs which need funding without priority attached to them.

We also ask that we be given substantial time at your December meeting to discuss our Final Report.

We look forward to your response.

Laurent Picard
Chairman

1.6.79

Attachment to Appendix E

The Consultative Group has considered that a reasonable allocation for emergency funding for the fiscal year 1979-1980 would be at the level of about $500,000.

We recommend that the following programs be included within the terms of a special grant of national priority (all of which could be implemented immediately):

1. Reorientation Grants

These would allow faculty in other fields to reorient their research interests to the field of Management and Administrative Studies. As such, it is anticipated that many of these scholars would soon be available for academic appointment in Faculties of Management and Administrative Studies. These activities could take the form of:

i) time off or grants for faculty who wish to take courses in Management and Administrative Studies, or

ii) grants to engage in research projects in the field of Management and Administrative Studies, or

iii) grants for research methodology workshops for faculty in other fields to study Management and Administrative Studies.

2. Doctoral Grants

The success rate of students for Doctoral Fellowships from Management and Administrative Studies is low. To encourage students to enrol or continue in the doctoral programs, a special grant of $8,000 per student would be available to fund an additional 30-40 students.

3. Post-Doctoral Awards

These would provide aid to young scholars who wish to undertake research or to take courses (including research methodology workshops) in Management and Administrative Studies.

4. Faculty Doctoral Awards

A large number of faculty find it difficult at present to complete their research for doctoral theses, especially due to their heavy teaching demands. This grant would allow time off for those faculty in doctoral programs to complete their doctoral work, or to provide grants for those faculty not now in doctoral programs to do so.

5. Part-Time Faculty Workshops

Due to the enormous difficulties in filling academic positions with full-time faculty, an exceptionally large number of part-time lecturers from professional occupations are hired to teach courses in Management and Administrative Studies. This program would fund week-long workshops for non-academic faculty, to revolve around research methodological questions, and humanistic and social issues.

Conclusion

These programs we regard as minimum steps toward the alleviation of a serious crisis in Management and Administrative Studies. The Canadian Federation of Deans of Management and Administrative Studies is willing to undertake the administration of these programs if, due to budgetary constraints, the Council is unable to do so.

Appendix F

REACTIONS TO THE INTERIM REPORT OF THE CONSULTATIVE GROUP

The Consultative Group has from the beginning taken very seriously its mandate to "consult" with a variety of groups interested in the state of graduate education and research in Management and Administrative Studies. Therefore, the Chairman of the Canadian Federation of Deans of Management and Administrative Studies (CFDMAS) and the President of the Administrative Sciences Association of Canada (ASAC) were invited to join the Group as associate members, in order to provide continual feedback on the concerns and reactions of Deans and faculty. One of the first activities of the Consultative Group was a series of visits by the Executive Secretary with faculty members and Deans at eight universities across the country (Memorial, Dalhousie, St. Mary's, New Brunswick, Manitoba, Calgary, Alberta, British Columbia). In addition, the Group held one of its meetings in Saskatoon in conjunction with the Annual Meetings of ASAC and the CFDMAS. Laurent Picard, Alf Chaiton, and Max von Zur-Muehlen made presentations to a special session of ASAC. Finally, a number of Group members were invited to regular meetings of the CFDMAS. Informal communication was constant. The Consultative Group wishes to take this opportunity to thank ASAC and the CFDMAS for their advice, support, and encouragement throughout the consultative process.

A major feature of this process was the preparation by the Consultative Group of an Interim Report for presentation at a national working conference sponsored and organized by the CFDMAS, "Managing in the 1980s: The Crisis in Management Education and Research", in Toronto, October 1-3, 1979. At the conference, faculty members, Deans, university administrators, government officials, and business executives discussed the Interim Report, and provided their reactions to its analysis and recommendations. The next section of this Appendix outlines those reactions.

A. Faculty

The general faculty attitude to the Interim Report was highly positive. Bob Sexty called the Report "a concise statement of problems that should have been addressed a long time ago." Several key problem areas came up in discussion. One of these was the question, "Why is management studies not regarded as a legitimate area of academic study?" The consensus was that universities promote "pure," traditional disciplines, and that gaining recognition within the universities, and in government agencies, was important. However, they argued that such recognition should not be secured at the expense of the professional status of the schools. The solution was seen as a "marketing job that needed to be done." Based on the lack of recognition was the issue of the state of management faculty within the university system. A number of faculty felt that the Report had not dealt sufficiently with the reward system available at management schools. Brent Ritchie stated that "just as students are 'voting with their feet' into management schools, so are faculty - out of them." Opportunity costs are also high for faculty, and attrition rates are high.

Concern was expressed with respect to the implications of unionization. It was felt that the economic well-being of faculty, especially in terms of salary and merit increases should be explored more fully. As well, the gaps between the individual's expectations while in Ph.D. programs and while teaching were great. Considering the perceptions by other faculty, the opportunity costs, and gaps in expectations, the situation has led to a feeling of frustration among management faculty. A key issue then was the question of how to improve the status of management faculty.

A different view expressed by some was that this issue would sort itself out, especially as enrolment continued to increase. Alternatively, through restricting enrolment, the quality, and status, would be raised to that of other professional schools, such as law, medicine, and engineering. In one sense, it was argued, a major problem was too much recognition. There seemed to be a strong movement toward including an applied dimension in other disciplines, primarily to attract students. Such a stituation had two effects: to represent competition to the objectives of management schools; and to modify greatly the concept of "pure" disciplines. In this way students were changing the traditional view of a university. As these views and attitudes change, the status of management schools and management faculty increase correspondingly.

Another major issue was that of reorienting faculty and doctoral students from other disciplines to management and administrative studies. The idea was well received, but it was felt that, at some point, the nature of this retraining should be more clearly spelled out. Some felt that the minimum would be to obtain an M.B.A. degree.

Brent Ritchie was concerned about the small amount of Canadian material being published in journals. The number of Canadian journals was very small, and American journals tended not to publish articles related to Canadian issues. It was felt that any new journal, whether functional or multidisciplinary, would fail unless special incentives were provided, either to the journals or to faculty. Another issue was that because of research funding criteria and procedures, faculty often were forced to orient their work to more traditional disciplines, such as economics, sociology, psychology, mathematics, etc. This was becoming a problem in terms of skewing the development of the field. It was pointed out that the private sector did not provide much funding for publishable research, and could perhaps provide "more money with less strings".

The proposal for a Management Research Council met with universal approval, although Bob Sexty argued that the concept of a "Coordinating Council" should not be abandoned. Some faculty felt that the organizational structure of the new Council should not be exclusively based on the Medical Research Council, but rather that there should be a new, innovative model, with provincial involvement.

B. Deans

The Deans of Canada's management schools approved most heartily of the Report. They felt that its analysis of the situation reflected their observations well. A number of questions came up. Michael Maher questioned whether the structure of the Medical Research Council was the most appropriate one, although he accepted the general analogy as sound. Peter Lusztig felt that the dissemination of information at an early stage concerning career prospects was very important. Most felt that the retraining option was viable.

A major issue was the distinction between a professional school and an academic department, between a professional discipline and a traditional discipline. A number of Deans felt that these differences could have been spelt out more in the Report. Pierre Simon expanded the issue by arguing that if a professional school is not the same as other Faculties, then perhaps the internal reward system in the university should also be different. This point gained general approval. It was pointed out by Bud Johnston that the developing proliferation of management and administrative studies courses in liberal arts programs was becoming a real problem, especially in terms of certification of quality. Max Stewart suggested that management schools might consider cutting down on the number of course offerings.

There was also a concern about the problem of quality control in the training of Ph.D.s, and the problems of rapid expansion in other fields were pointed out. A number of Deans countered that past experience would be used as background information in any future expansion of doctoral programs in Management and Administrative Studies.

Many Deans suggested that the Consultative Group should perhaps try to put a specific figure on the amount of additional funding required. In discussion, it was generally agreed that a range of $3-4 million annually for at least five years was not out of line.

C. Government Officials and University Administrators

Ian Macdonald called the Report "highly important" and stated it was very thought-provoking and suggestive. To that extent he found the Report somewhat frustrating because he had hoped that it would deal at greater length with a number of issues that were raised. Among these questions were the following: first, to what extent are Canada's economic problems related to managerial problems?; second, is Canadian management too small and cozy, overprotected, and disinclined to take risks?; third, what is the role of entrepreneurship in the economy, and how does it relate to management schools?; and fourth, what is the evidence that we are moving to a managerial society? He pointed out that he did not necessarily disagree with the Consultative Group, but rather that he wanted more information and argument.

He felt that perhaps more attention could have been paid to the research issue, and thought that the recommendation on more research in areas of special relevance to Canada was the most important of all the recommendations.

He argued that while the federal government must play a much larger role in graduate management education and research as part of a larger evolving strategy, still he was not convinced that the creation of centralist bodies was the route to go. It may be necessary, but he wanted some more background discussion. A Management Research Council more broadly-based than the Medical Research Council model might well be best suited to the present situation.

In general, he found the Report good on description, analysis, and recommendations, but not as clear on specific goals and direction.

Hugh Faulkner felt that the structure of the SSHRCC was not as rigid as many people assume, and suggested that the Group should not ignore the option of adapting SSHRCC to the needs of Management and Administrative Studies. He pointed out that when the government was dividing the Canada Council, he didn't pick up a sense of urgency in management education. A key question, he believed, was whether more money would be made available. If not, then the organizational structure of distribution was less important. He suggested that business, as the schools' client group, was the only group in a position to contribute additional funding, and perhaps should support a new Management Research Council.

David Slater felt that management schools needed to build bridges - closer relations with business, government, and the universities. A much broader context was necessary. He thought that a meaningful management studies panel within the SSHRCC, as a half-way house, may be necessary, since it is very difficult to establish granting councils. In addition, he suggested that the Economic Council has had some success with summer research stipends, and that other agencies and groups might wish to consider them for management faculty.

Other officials and administrators at the conference endorsed the Report and its recommendations. Some stated that the purposes of management schools should be spelled out, especially the skills learned by students at the conclusion of their programs. Others said that the curriculum should be looked at carefully to see if it conformed with those skills to be developed.

One question concerned the reorientation process, and a number of individuals wanted more information on how this was to be done. A second issue was the role a management school plays in a university. Finally, some wondered whether the training necessary for government, business, and university careers could be successfully combined in one program.

D. Business Executives

Creighton Cross stated that he was interested in the development of "literacy" at the university. He defined literacy as "understanding the context within which you will be." Therefore, he felt that the primary task of a management school was to develop "business literacy", an understanding of the business environment. However, the schools should not prepare students to know what business does, but rather to do what business does. Particularly important in this context was the business/society/government interface. This last point was emphasized by all business executives.

One key question was whether management schools educate managers or entrepreneurs or technocrats or academics. As such, it was important to draw out what the output of an education at a management school will be. Patrick Rich described this output as the development of knowledge, attitudes, and skills. Knowledge implied an emphasis on "hard disciplines", such as mathematics or logic, and taught in a traditional way. Two aspects he emphasized were more knowledge of the international environment and the business/society/government interface. Attitudes, on the other hand, were best taught by psychodynamic pedagogy. Two attitudes that were particularly desirable were the propensity to cooperate and toleration of differences. The learning of new languages and an emphasis on predictive techniques were valuable tools to develop these attitudes. The most important of the skills that Rich noted was that of communication. The best method was participative learning, especially role-playing and simulation. Bill Birt emphasized the ability to analyze and diagnose, and then to make judgements. Alan Marchment specified analysis, logic, order, etc. As such, he argued, the skills learned in a discipline such as classics, for example, were the same as those brought out in commerce, at least at the undergraduate level. Maurice Sauvé drew out as desirable skills the ability to communicate, to manage people, and to deal with government. Business needed people with general management skills. As such, at the undergraduate level, a general liberal education was best, while specific skills in management could be provided at the graduate level. Sydney Jackson desired broadly educated students.

Another area emphasized was the growing significance of continuing education for managers. A management school should be regarded as a halfway house between elementary and secondary education, and management development. Therefore, management schools play a key transitional role, as well as taking their part in continuing education. One question that should be asked more often, the executives argued, was "What do the users want?" The significance of the Report and the Conference were their roles in beginning that process. Most of the businessmen were wary about the call for more private sector funding to management schools. University education and research were responsibilities of the provincial and federal governments, which the private sector supports through the tax system.

They strongly endorsed the reorientation recommendation, but some felt that the proposal for a sabbatical year for business executives at a university would not work. Internally, within the university, retraining was warranted, but should be used to maintain or upgrade the quality of the faculty, not to find a place for surplus staff. Management schools must strive for excellence. Some executives felt that this meant restricting enrolment, especially at the graduate level, to get only the best students in the programs.

They felt that management schools were having a difficult time in coping with the demands made on them, and that while they were not yet in a crisis situation, it might be developing. One recommendation they had was that the schools should make their objectives better known in the business community and to government.

In general, they strongly endorsed the recommendations of the Report, and were keenly interested in examining the implications for curriculum of the schools and the research done by management faculty.

Appendix G

ON THE ESSENCE OF BASIC AND APPLIED RESEARCH IN THE ADMINISTRATIVE AND OTHER INSTRUMENTAL SCIENCES

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1. Applied Science versus Applied Research.

The administrative sciences, and with them most other applied or professional studies, seem to have truth or acceptability criteria that differ considerably from those of the pure or cognitive sciences. This might be surprising since both areas basically apply the same scientific methods of (1) observation and often controlled experimentation, (2) systematic descriptions and measurement, (3) generalization and induction, (4) analysis and deduction, (5) interpretation and model building as well as (6) testing through verification, confirmation, falsification and related procedures. The administrative and other applied sciences are no less charged with finding factually well supported generalizations about reality, but their reality extends to human beings with needs, preferences, and goals; above all this reality includes the instruments by means of which we can efficiently attain those goals. Furthermore, for the applied scientist science consists not merely in the comprehension of but the interaction with and partial control of reality. Thus, in spite of the similarity of methods between pure and applied sciences, there exist -- as strange as it may sound -- great methodological differences as well as additional methodological complications for the administrative sciences. This may be one reason why experts of the pure sciences have great difficulty in appreciating research projects, methods, and efforts of applied scientists.

In spite of the fact that some applied sciences such as medicine and engineering have attained high academic prestige, the epistemological and methodological problems of applied science in general have hardly been explored systematically. In addition, the administrative studies (including the entire gamut of business and management sciences), in spite of considerable progress, have still to struggle for due recognition. This is well reflected in the following misunderstandings: (1) While most laymen or outsiders would willingly recognize that, for example, medicine is involved in pure as well as in applied research, the majority of those outsiders believe that there is no possibility for the administrative sciences to do basic research. In other words, the distinction between pure and applied research is erroneously identified with the distinction between pure and applied science. Therefore, we might cast a glance at the accepted definitions of, or distinction between, pure and applied research in order to understand better the problems confronting research in our discipline. (2) Clinical research is well recognized as a legitimate kind of research in the health sciences, but is often looked at askance by research foundations when encountered in the administrative and management sciences. This statement is far from recommending the mere writing of business cases as serious research, but it pleads for a clear distinction between "case writing" and "case research" and the eventual promotion of the latter -- for details see C.B. Johnston (1979).

Kidd (1959), p. 368, for example, states that there are two different and possibly contradictory groups of definitions of pure versus applied research: namely, those which on the one hand define research in terms of investigators' motives and intent, and the conditions under which they work, and alternatively those which refer "not to investigators but to the work itself". And Machlup (1962), p. 146, continues this argument by saying something that might be of special interest to research foundations, granting agencies and their teams of evaluators: "If the statistician has to decide whether a particular sum of money spent by a particular research team should be entered in the column "basic" or in the column "applied" research, he cannot in advance evaluate the nature of the findings which this team may eventually produce. He can at best evaluate what the director of the team says they intend to find". The National Science Foundation (1960), p. 5, offers a more direct answer by the following definition: "Research is systematic, intensive study directed toward fuller knowledge of the subject studied. Research may be either basic or applied. Basic research is directed toward increase in knowledge; it is research where the primary aim of the investigator is a fuller understanding of the subject under study rather than a practical application thereof. Applied research is directed toward practical applications of knowledge." Machlup (1962), pp. 147-149, emphasizes that "Better understanding of the physical or organic world is the goal of basic research, better products or better ways of making them are the goals of applied research. This sounds like a rather clear contrast between the two, but in reality the borderline cases are very numerous and the classifiers have a hard time filling out the report forms... To describe the difference between basic and applied research, it has been suggested that the former is after discoveries, the latter after inventions. There is much to be said for this suggestion; as I see it, the concepts of 'inventive activity' and 'applied research' overlap to a large extent. But neither the official definitions nor the private ones favoured by industrial research laboratories accept the suggestion. The National Science Foundation in its instructions for the 1957 survey restricted applied research to 'research projects which represent investigation directed to discovery of new scientific knowledge and which have specific commercial objectives with respect to either products or processes'."

All this indicates that the frequently applied rule of thumb that basic research is carried on in the departments of physics, chemistry, etc., of the faculties of Science, as well as in the departments of economics, psychology, sociology, etc., of the faculties of Arts, while applied research is done in the departments of electrical and chemical engineering, etc., of the faculties of Engineering, as well as in the departments of accounting, finance, etc., of the faculties of Business Administration, is by far too simplistic and definitely misleading. Machlup (1962), p. 148, confirms this in the following way: "I recall, for example, very pure and fundamental research in turbulence undertaken by an aeronautical engineering department. And many other researchers in engineering schools have strong claims on having their projects recognized as basic research." And the same

holds for research in the areas of administrative studies. The accounting and auditing research for developing acceptable norms of reporting as carried out by public accounting bodies may well constitute applied research, but the attempts of accounting professors to adapt ideas from information economics to management information systems in general, or the development of a general theory of accounting valuation, undoubtedly belong to basic research. If, therefore, the means-end relation characterizes an applied science, it does not necessarily identify applied research, the criterion for the latter should rather be sought in the specificity of the research project together with the immediacy of its commercial exploitation.

However, to gain better recognition the administrative sciences have to make further strides in several directions. In the administrative disciplines, for example, one is often searching for truth without sufficient familiarity with the special truth criteria peculiar to one's subject. How often does one accept mere correlations as though they were causality relations? How rarely does one bother to check the boundaries of one's hypotheses? How often does one accept a hypothesis as being universally valid while it actually is narrowly bounded and restricted to a minute area of validity? Is the search for genuine scientific laws at all meaningful in the applied sciences? Do they explain and predict in the same way and at the same degree of reliability as the pure sciences? Is it not better for these disciplines to concentrate on conditional projections and sound simulation studies instead of chasing after elusive universal hypotheses which might never be found within the realm of means-end relations? How often do administrative scientists, especially in their behavioural research activity, apply blindly and thoughtlessly statistical confidence criteria without awareness of their conventionality? Do administrative scientists not too much attempt to imitate the pure sciences instead of developing their own methodology and truth criteria? Can the administrative scientists afford to neglect value judgments to the same extent as the natural scientists have done traditionally? Can the former afford the same atomistic approach that was pursued by the latter, or is it not indispensable for applied scientists in general to adopt a more holistic point of view?

Before entering the discussion towards overcoming those problems I should like to examine in some detail the special differences between the pure and the applied sciences and the problem of creating an epistemology for the latter.

2. Administrative Sciences and Their Methodology*

The philosophy of applied science, although never systematically elaborated, has an ancestry that can be traced from Aristotle's Nicomachean Ethics over Kant's Critique of Practical Reason (1788) and Critique of Judgement (1790), to Bogdanov's Tektologia (1912), Hostelet's L'investigation scientifique des faits d'activité humaine (1960) and Kotarbinski's Praxiology (1955/65). But none of these pio-

neering efforts is sufficiently integrated with, and focused specifically upon, a philosophy of applied science. Only in the most recent past have attempts in this particular direction been made: Bunge in the second volume of his monumental work on Scientific Research (1967) devoted the entire Chapter II (Vol. 2) to the philosophy of applied science. And much of Churchman's writings (e.g., 1961, 1968a, 1968b) is penetrated with thoughts closer to applied than pure science.

Furthermore, some of his disciples, for instance Mason (e.g., 1969) and Mitroff (e.g., 1973) as well as other management science philosophers such as Helmer and Rescher (e.g., 1959) seem to share his special orientation of epistemology. Occasionally one encounters similar interests in areas beyond management science; the magazine Technology and Culture, for instance, devoted an entire issue (Vol. VII, No. 3, 1966) to this topic under the topic "Toward a Philosophy of Technology". See also Rapp (1974).

Both pure and applied sciences fulfill a cognitive as well as an instrumental task, but in each branch these two ingredients are mixed in different proportions. Roughly speaking, one might say that the cognitive element dominates pure science: all of its statements have a sufficiently high degree of reliability as to be assumed true, but their specific usefulness may not be established. Whereas the instrumental element dominates applied science: all of its statements are assumed to be useful but their degree of reliability is not necessarily high enough to regard them as true in the conventional sense. Thus the applied sciences use the same methods as the pure ones (observation and measurement, induction and deduction, interpretation and testing, etc.) but with a fairly specific purpose in mind, and under consideration of an economic or cost-benefit criterion. The distinction between pure and applied science is not simply that between "knowing" and "doing", but rather that between "believing for the sake of knowing" and "believing for the sake of doing". And since epistemology cannot restrict its concern to knowing but must be equally concerned with believing, the philosophy of both pure as well as applied science belongs to it.

Obviously, there exists neither an absolute nor a generally accepted line of demarcation between pure and applied science. And Figure 1 offers nothing but a crude categorization of science in general.

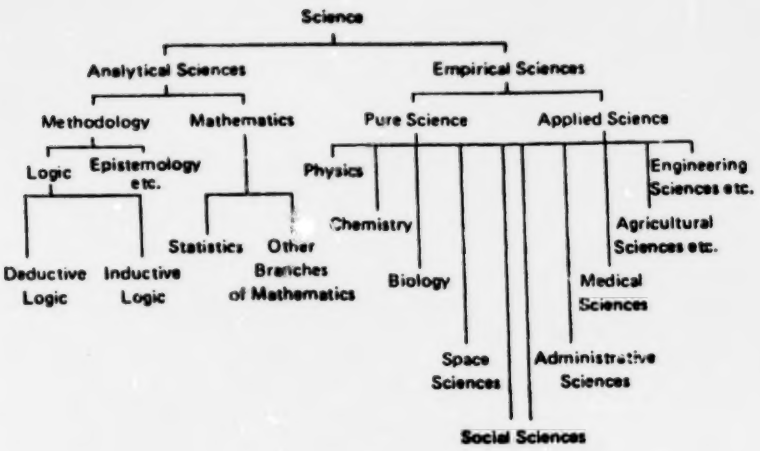

Fig. 1

The distinction between analytical and empirical science is one of the most favoured categorizations of our time. But it was not always accepted, nor is it certain that it will survive in future. Quine (1953), for instance, tried to exploit Gödel's incompletability theorem to express doubt that the distinction between analytical and empirical propositions is justified. However, as long as the counter-evidence supplied by Quine and others is not more conclusive, we might accept these two categories, at least provisionally, as mutually exclusive and exhaustive. The analytical sciences deal with statements irrefutable by experience. Their most important branches are logic and mathematics, both consisting of nothing but tautologies. Whether logic is a branch of methodology or vice versa is still disputed (the same holds for methodology vs. epistemology) - even worse, there is not even a consensus as to the nature of the statements generated by methodology, epistemology and philosophy in general.

The empirical sciences deal with statements which, in principle at least, are refutable by experience. Such statements are not true by necessity and thus are never completely reliable. Their truth is a provisional one and based on the strength of the pertinent evidence. If such statements are unrefuted and, in addition, sufficiently corroborated or confirmed or grounded, then they are assumed to be true. But when is a statement sufficiently verified? This is one of the most puzzling questions of epistemology, and its discussion is dealt with in Chapter 5 of Mattessich (1978).

At the beginning of the empirical spectrum (right-hand side of Figure 1) there are the "purest" sciences such as physics, chemistry, etc., as well as the less pure space sciences (geography, astronomy, etc.) and social sciences (psychology, etc.), further down are more or less applied sciences, the foundational research of which may be close to or even transgress into the area of pure science (economics, management science, systems science, etc.), and finally there are the extreme applied sciences such as agricultural science, engineering, etc. The boundary between pure and applied sciences is fairly

arbitrary and the distinction between both is an issue of semantics. In this paper we merely rely on the criterion outlined above for distinguishing one from the other.

But there is another distinction frequently encountered, that between applied science and technology (invention). Some authors (Hatfield, 1933; Agassi, 1966; Skolimowski, 1966; and Wisdom, 1966) try to separate these closely related notions, yet when it comes to the definition of each area, there seems to be little common ground. Others regard the spectrum from pure science over applied science to technology as consisting of many discontinuities, but none large enough to find articulate thresholds of demarcation. In this regard we share Bunge's view, and his words hold no less for the present work than for his own contribution: "The terms 'technology' and 'applied science' will be taken here as synonymous, although neither is adequate: In fact, 'technology' suggests the study of practical arts rather than a scientific discipline and 'applied science' suggests the application of scientific ideas rather than that of the scientific method. Since 'technique' is ambiguous and 'epistechnique' unborn, we shall adopt the current lack of respect for etymology and go over to the serious matters." Mario Bunge (1967, p. 329).[1] Yet this view must not be identified with the pragmatic notion which regards any science - whether pure, applied or technological - as exclusively instrumental. Such a notion forces the pragmatist either to negate the cognitive function of science or to identify truth with usefulness. The opposite philosophic extreme is encountered in rationalism which rejects the truth notions of pragmatists and empiricists alike and tends, at least in its undiluted version, to accept only analytical insights as truly cognitive....

Management science is in a position to contribute more than any other instrumental field to the philosophical analysis of all applied areas. This is neither a novel view, nor is it merely due to the author's background. Even a logician like Kotarbinski (1965), pointed out that "It is only of late, perhaps only in the last seventy years, that something like a general praxiology has emerged. I refer to certain works by individuals working on the theory of business management. They include numerous very general observations, so general that in many instances the idea of a rationalizing engineer coincides with a philosopher's methodological idea...This is by no means a problem specific to business management" (Kotarbinski, 1965, p. 7).

This trend has been reinforced by the metamorphoses which the administrative sciences underwent since the second World War. Not only did this lead to more rigorous research methods, but also to contributions preparatory for a philosophic analysis of applied science. We think primarily of the Systems Approach [discussed in Chapters 2 and 7 of Mattessich (1978)]. As to the general methodology in these fields, a point has to be made that is rarely sufficiently emphasized. Predominantly descriptive presentations gave way to analytical-empirical approaches; and the experts of business, industrial and public administration, political science, systems

analysis, economics and management science, succeeded in adapting scientific methods to their applied disciplines. The deployment of modern mathematical tools in these areas led to more rigorous ways of thinking as well as to a host of theories and models of various degrees of generality. Indeed, administrative scientists nowadays are engaged in a continuous process of theory construction to a greater extent than are natural scientists. A good deal of the latter are rather concerned with what the well-known historian of philosophy of science, Thomas Kuhn, calls "mopping-up operations", i.e., with the elaboration and strengthening of existing theories.

> Mopping-up operations are what engaged most (natural) scientists throughout their careers. They constitute what I am here calling normal science. Closely examined, whether historically or in the contemporary laboratory, that enterprise seems an attempt to force nature into the preformed and relatively inflexible box that the paradigm supplies. No part of the aim of normal science is to call forth new sorts of phenomena; indeed those that will not fit the box are often not seen at all. Nor do (natural) scientists normally aim to invent new theories, and they are often intolerant of those invented by others. Instead, normal-scientific research is directed to the articulation of those phenomena and theories that the paradigm already supplies.[2]

Our remark is by no means meant to be derogatory of natural science. On the contrary, the mere fact that pure scientists are dealing with deeper, more general and perhaps more permanent theories than applied scientists, requires the former to devote more time and energy to consolidating their theoretical structures. Applied scientists, in contrast, are less concerned with cognitive than with instrumental theories, less with general than with fairly specific paradigms which are directed toward particular goals. It is this difference in activity and orientation which keeps the administrative scientist busy with theory and systems construction, making him the model builder par excellence. But such intensive concern with the construction of theories, models and systems puts a heavy and, in a way, new responsibility on the administrative scientist. None of his innumerable models is of much use unless to be tested; to be tested not so much as to its truth, but as to the degree of accomplishing its purpose. Yet, this is a highly complex issue and plunges him head on into philosophic reflections presently dealt with in management science. This aspect arouses problems of many branches of methodology (logic, epistemology, praxiology, ethics, mathematics, systems theory, etc.) and the recent infatuation of many administrative scientists with mathematics might give way to a greater concern with philosophic issues. Indeed, there exist tokens that the mathematical emphasis in management science is shifting away from purely technical considerations to those of fundamental and structural significance. Above all, management scientists have adopted a philosophic framework that enables them to reconcile the goals of a specific system with the goals of the super-systems in which the former is embedded. Or, in Churchman's words:

> For the applied scientist, scientific method must include philosophy of the whole system, however vague, however inadequate, however difficult to defend....The pure scientist believes he can discover truth in a piece of reality without disturbing the whole....The more heroic applied scientist tries to bear the burden of the enormous risk and the vagueness of his Weltanschauung....The applied scientist is - or struggles to be - both a humanist and a scientist. For him science is an art, an ethic, a comedy, and tragedy.[3]

Thus the applied scientist must be acquainted with the major issues of up-to-date scientific and philosophic thinking. To construct proper theories he will do better when aware of the revolutionary reorganization of deductive logic since George Boole made his contribution. To test theories and systems, an acquaintance with recent issues of inductive logic will make him more advertent. To adjust the tools of pure science for applied purposes, he may even need insight into praxiology and analytical ethics. The fate of the future lies in the hands of the applied scientist; if we train him to become a narrow-minded technocrat, his skills may not benefit, but terrorize, mankind.

We are now in a position to conclude that the philosophy of instrumental science investigates the validity and reliability of generalized knowledge about purposeful actions. By necessity it comprises traditional epistemology but must go beyond it to lay the foundation for the supplementary problems listed subsequently. But actions are usually prepared within more or less complex decision systems, and the pertinent problems must be conceived in terms of such systems.

(1) The Problem of Design: The optimal or satisfactory matching of a system structure to the specific goal pursued by the system. This problem is obviously related to the classical problem of theory construction. But the task of a theory is to represent reality at a degree of approximation considered to be satisfactory (whatever "satisfactory" may mean), whereas the task of a system is to fulfill a more specific and often non-cognitive purpose. The latter includes not only the mere attainment of a task but its attainment under certain constraints, among which economic efficiency constraints assume a prime position. Hence, considerations of the cost-benefit criterion play a decisive role in the problem of system design.

(2) The Problem of Conflict and Resolution: The conflict between the goals of different systems and the resolution of such a conflict constitutes a typical dialectical problem and plays an eminent role in every applied science. Whether the decision involves a conflict between keeping too large a quantity of merchandising stocks, safeguarding good customer service, versus too low stocks, avoiding excessive storage costs, or whether it refers to the conflict between administering too high a dosage of diphtheria serum, securing an effective reaction in the patient, versus too low a dosage, avoiding

fatal overreaction, or whether it concerns any other kind of goal conflict, a resolution in the form of an optimal, quasi-optimal, or at least satisfactory decision is needed. Often a conflict exists between the goals of two or more sub-systems to be resolved within the goal of the main system, or alternatively, the conflict between the goal of a sub-system and the goal of the main system to be resolved in the goal of a supersystem. Therefore, this issue involves two further subproblems; (i) that of the hierarchy of systems, and (ii) the cybernetic problem of feedback and interdependence of elements as well as of systems. The classical analogue to this problem complex is more difficult to discern; it might be found, on one side, in reductionism (which conceives of a hierarchy of scientific disciplines claimed to be ultimately reducible to the primitive notions of physics), and, on the other side, in the theory of coherence (which emphasizes the complementarity and thus interdependence of all scientific truths).

(3) The Problem of Testing, Rejecting and Accepting: How can a decision system be tested as to its goal fulfillment and efficiency? Does the system fulfill its purpose at a reasonable degree? Does it satisfy the minimal criteria set for it? Shall it be accepted, revised or rejected? These questions resemble closely those of hypotheses and theory verification encountered in traditional epistemology. But there exist marked differences between the testing of cognitive hypotheses and theories on one side, and the testing of instrumental hypotheses and systems, on the other. Table 1 indicates, in rough strokes, some major differences between cognitive and instrumental hypotheses influencing their testing procedures.

TABLE 1

Some characteristics distinguishing cognitive from instrumental hypotheses

	Cognitive hypotheses	Instrumental hypotheses
(i)	Structure of the general form: "All A are B" and variations.	Structure of the general form: "To attain A do B" and variations.
(ii)	Non-teleologic.	Goal oriented.
(iii)	Efficiency irresponsive.	Highly efficiency responsive.
(iv)	Rigorous criteria of acceptance based on truth assumption.	Relaxed criteria of acceptance based on assumption of better goal attainment.
(v)	High degree of generality.	Limited degree of generality.
(vi)	Not behaviourally limited.	Predominantly oriented toward decision behaviour.
(vii)	Oriented toward cause and effect relations.	Oriented also toward reason and action relations.
(viii)	Serving the inference of statements within assertorial (declarative) arguments.	Serving the inference of imperatives, etc., within deontic (normative) arguments.

The difference between cognitive and instrumental hypotheses shall be illustrated by the following two versions of a proposition frequently encountered in microeconomics and the administrative sciences:

(CH) "The maximum net return of an enterprise is attained at that production (or sales) volume at which the cost increment (marginal revenue) equals the revenue increment (marginal revenue)."

(IH) "In order to maximize the net return of an enterprise, attain a production (or sales) volume at which the cost increment equals the revenue increment."

Sentence (CH) constitutes either an analytical or empirical cognitive hypothesis. It is analytical if certain mathematical conditions are implied or stipulated, in such a way that the sentence becomes a tautology and thus its truth a matter of logic necessity (e.g., if it shall refer only to situations where the cost curve is

either a linear function, or a cubic hyperbola, etc., and the revenue curve is either a linear function or a quadratic hyperbola, etc.). If, however, nothing is known about the shape of cost and revenue functions, this same proposition becomes an empirical hypothesis, because it then is open to refutation by experience (e.g., in some situations of discontinuous cost or revenue functions (CH) would not hold). In this case, the sentence (CH) actually is a refutable, hence empirical, hypothesis about the cost behaviour of all firms within a certain universe. Ideally, this universe is assumed to be unbound. But this assumption is always precarious; in the physical sciences it may nevertheless be permissible, but is less so in biology (e.g., different biological laws may hold for extraterrestrial organisms), even less so in the social sciences and least permissible in the administrative and other applied sciences. For this very reason, sentence (CH) and similar propositions of economics are frequently regarded as idealistic or unrealistic hypotheses. Obviously, the more narrowly the universe is defined, the less law-like becomes the character of this "universal" sentence. If, on the other hand, the universe is defined too broadly (as is frequently the case in the social sciences), instances of refutations can easily be found. And even if one argues that a single instance of refutation need not necessarily falsify an empirical hypothesis (since the refutation may be due to measurement, observation or experimentation errors), it would be too tenuous to apply this argument to hypotheses of the type mentioned above.

A solution to this dilemma is found by interpreting our propositions in the form of an instrumental hypothesis (IH). Imagine the naive situation in which a management consultant, Mr X, gives advice on the basis of this hypothesis, since his experience has shown that (i) it holds in more than 80% of the cases of his consulting business, and (ii) a failure rate of not more than 20% does not prove too harmful for his practice. In this case, the instrumental hypothesis (IH) has a truth value expressible on a probability scale and is even considered acceptable; but in view of the relatively high rate of negative outcomes, one cannot pretend it constitutes an absolute truth (because no longer can one argue that the negative outcomes are due to observational or similar errors). Thus, an instrumental hypothesis is acceptable because the assumption that it is "goal attaining" is supported by stronger evidence than that of any alternative available, whereas a cognitive hypothesis is acceptable because the assumption that it is "true" is supported by sufficiently strong evidence (according to rigorous but arbitrary acceptance criteria set in such processes as verification or corroboration or coherence testing, etc.).

This raises the question whether instrumental reasoning is at all concerned with truth and belief (as is cognitive reasoning and traditional epistemology) or merely with usefulness. Or can one argue that an instrumental hypothesis is useful only by virtue of the fact that it possesses a truth value (i.e., a probability)[4] which, in relation to other factors, determines its acceptability and preference

...ier instrumental hypotheses? To answer this question we have ...plore further aspects contained in Ch. 2 of Mathessich (1978). ...spite of the crude example here offered, we hope that it has ...llustrated that instrumental reasoning harbours unexplored philosophical aspects and may constitute an economic extension of traditional epistemology.

(4) The Problem of Epistemo-Economics: Closely related to item 3 is the question whether the creation of knowledge has an economic aspect. If it has one, this can hardly be discerned from the conventional theory of knowledge. Only recently, under the impact of game and decision theory, have epistemologists like Carnap (1962, p. 269) and Hempel (1965, pp. 75-76) begun to employ a notion which Hempel calls "epistimic utility". Thus philosophers can no longer ignore the fact that information and knowledge systems are costly, nor can one continue to accept the time-worn assumption that any creation of knowledge is worth its cost. Thus, one may suspect that epistemology possesses a long neglected economic dimension, which creates the need for a border discipline in which economics and philosophy of science intersect. This sub-area is closely related to information economics but is not identical with it (just as the notions of information and knowledge are not synonymous). For lack of a better expression, we christen this embryonic sub-discipline epistemo-economics [for details see Chapter 6 of Mattessich (1978)].

At a superficial glance, it might appear that this idea promotes a pragmatic philosophy. But there is a fundamental distinction between pragmatism and epistemo-economics. The pragmatic view that something is true because it is useful, must not be confused with the belief that truth in the long run may prove useful and that the relation between truth and usefulness requires further exploration.

3. Upgrading the Methodological Knowledge of Administrative Scientists

The first step in overcoming the major obstacle impeding sound research in the administrative sciences is a thorough training of administrative scientists in the methodology of the applied sciences in general. In many instances this kind of knowledge and training has been neglected in many schools of commerce and business administration -- and often with vengeful results. Most frequently the meth- ...logical training of young scholars in our discipline is restricted to statistical methods; occasionally one offers courses imparting basic skills and techniques in empirical research, but relatively rarely are students advised to take courses exposing them to the full range of epistemological and methodological problems of the applied and social sciences. For this reason leading schools of business administration have (during the last decade or so) established a range of courses designed to bridge this specific gap.[5] However, departments, schools or faculties of business administration with only a few doctoral students can hardly afford to maintain such a gamut of fairly expensive courses. For this and other reasons it has

been suggested (e.g. by Professor R.J. Burke of York University, Toronto -- see his paper "A Potential Model for a Research Methodology Workshop", commissioned by the Canadian Federation of Deans of Management and Administrative Studies 1978-79) that special workshops in research methodology should be arranged for young scholars and professors of business administration.

I wholeheartedly embrace the basic idea behind this suggestion, but should like to add some amendments and alternatives to Professor Burke's paper. Above all, I would not restrict this workshop to research methods or techniques, but would extend it to methodology in the broad meaning of the word.[6] Indeed, such a workshop might be taught by three or more instructors and might consist of the following three parts: 1. Statistical Research Methods, 2. Empirical Research Techniques, 3. Methodology of the Applied and Social Sciences. Only the inclusion of the third item would warrant the raising of this workshop beyond the purely technical level of conveying skills and techniques. In the administrative sciences it is paramount that we do not merely apply truth or acceptability criteria of other disciplines, etc., but that we also understand their full impact, that we examine them critically, and that we possibly develop new truth or acceptability criteria, suitable to the special needs of our own discipline. One might even offer different courses for different areas of specialization (as Professor Burke suggests) as far as part two is concerned, but I would be reluctant to implement this for the first and third parts.

For two reasons I should like to abstain from going into details as regards the full content of the third part of this workshop: firstly, I have already offered you in the preceding section some hints about the methodological aspects and difficulties of the applied sciences; and secondly, I should like to refer to the previously quoted book of mine which grew out of a decade of experience in teaching methodology to graduate students of business administration and other applied sciences. In this connection I might emphasize that I am not a philosopher by academic training, but that my interest in methodology grew out of my own research in accounting theory and management information systems. Such an organic growth of methodological curiosity is decisive, and it would not do to hand our graduate students and young scholars over to the philosophy department for this kind of training. Apart from the fact that very few departments of philosophy are in a position to offer a course in the epistemology and methodology of the <u>applied</u> sciences, the typical philosopher's approach might quickly discourage students used to an entirely different conceptual apparatus and mental approach. This does not mean that we should discourage our brightest students from taking courses in "pure" philosophy. Some of my students did indeed take courses in U.B.C.'s Department of Philosophy, but their success was much greater after they had had the background of one or two of my courses in methodology.

A further consideration in connection with Professor Burke's paper is the question of the timing of such a workshop. I personally think that for a first exposure 4 to 6 weeks of concentrated sessions would be the very minimum. But after some serious reflections we, at U.B.C., have come to the conclusion that a summer workshop, for several reasons, might not be very desirable. First of all, this is the prime time when faculty members should take the opportunity to do research -- unfortunately, for many of us, it is the only time when we are sufficiently unburdened from teaching and administrative duties. But even if those attending the workshop could spare the summer time, those who do serious research are the ones who should be teaching in such a workshop; but just those scholars need the summer months most urgently for furthering their own research projects. Finally, only a lengthier workshop would prevent a mere surface exposure. Thus, we feel that the optimal solution would be if scholars interested in taking the pertinent research methodology courses would be freed by their own university for a semester in order to attend a Canadian university offering the pertinent set of graduate courses. At U.B.C. we would try to do our best to accommodate every Fall term a limited number of such "visiting scholars". Indeed, during the last five or six years I have had visiting scholars from Canadian universities as well as from Germany, Hong Kong, India, Italy, New Zealand, Sweden, and other countries (e.g. from Africa) attending my research methodology seminars as auditors.

4. Promotion of Basic Research in Methodology

In order to promote the administrative sciences, it is not sufficient to teach methodology to future and present scholars; one must further expand research in the methodology of the administrative sciences in particular and the applied sciences in general. There are hosts of pertinent, unsolved methodological and epistemological problems. Some are carried over from traditional epistemology of the pure sciences, but many are peculiar to the applied sciences and have hardly been tackled. Instrumental methodology and epistemology are areas of the applied science where genuine basic research is possible. Such basic research neither need nor can be borrowed from the pure or cognitive areas. The precise direction of such research will depend on the individuals pursuing it; however, I personally believe that the most promising route is the one chosen by the more serious of the systems theorists, like Ackoff, Churchman, Herbert Simon, Mesarovich, Rapoport, and many others. With the exception of Herbert Simon all or most of these scholars reject the positivistic and atomistic interpretation of science and plead for a more holistic outlook which neither neglects the social and economic environment of scientific activities nor the value judgements involved in and connected with these activities.

The starting point to such an undertaking might be a critical analysis of Tarski's purely semantical truth notion from a systems point of view, and possibly a further extension of this truth notion. The still dominant correspondence theory of truth might have to be

abandoned or converted into a configurational theory of truthfulness of representation (for further details of this typical systemic notion see Mattessich 1979a and b) which permits a common structural basis for the two notions of truthfulness and usefulness. It is the close connection of these two notions which is so crucial in the administrative sciences and which is beginning to assume increasing significance in modern epistemology. Philosophers might finally realize that for too long a time the concept of usefulness was suppressed and disregarded in epistemology. However, under the impact of statistical decision theory this no longer is possible and philosophers will have to disclose the economic aspects of knowledge creation (see Mattesich 1974 and 1978, pp. 224-233). But this will lead to very different and hopefully better results than those supplied by pragmatic philosophy which erroneously attempted to identify truth with usefulness or at least derive the former from the latter. But it is not my intention to elaborate here the epistemology of applied sciences but merely to offer a few hints of the depth to which such inquiries might penetrate. For further details I kindly ask the reader to consult the literature mentioned.

I hope, however, to have pointed out that methodological research of the applied sciences is a very new, exciting and promising area of research without which the administrative sciences will not be able to exhaust their true potential.

Bibliography to Appendix G - Richard Mattessich: "On the Essence of Basic and Applied Research in the Administrative and Other Instrumental Sciences"

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Footnotes to Appendix G

*This second section is a reprint from Sections 1.2 to 1.4 of R. Mattessich: Instrumental Reasoning and Systems Methodology -- An Epistomology of the Applied and Social Sciences (Dordrecht/Boston: D. Reidel, 1978), pp. 6-16.

[1]But Bunge distinguishes among the applied sciences (technological theories) between substantive theories (e.g., electrical and mechanical engineering) and operative theories (e.g., operations research and other administrative sciences).

On the other hand the theories of value, decisions, games, and operations research deal directly with valuation, decision making, planning and doing...These theories are technological in respect of aim, which is practical rather than cognitive, but apart from this they do not differ markedly from the theories of science. In fact, all good operative theories will have at least the following traits characteristic of scientific theories: (i) they do not refer directly to chunks of reality but to more or less idealized models of them... (ii) as a consequence they employ theoretical concepts...(iii) they can absorb empirical information and can in turn enrich experience by providing predictions or retrodictions, and (iv) consequently they are empirically testable. Bunge, Scientific Research II, The Search for Truth, 1967.

With regard to subdividing applied sciences and distinguishing them from pure sciences, we find ourselves in accord with not only the view expressed by Bunge, but also with the writing of Ackoff, Churchman and other management scientists.

[2]Kuhn, The Structure of Scientific Revolutions, 1962, p. 24

[3]Churchman, A Challenge to Reason, 1968, pp. 133-134.

[4]This, of course, assumes that a multivalued truth is permissible.

[5]The Graduate School of Business Administration of the University of California in Berkeley, for example, offers four different graduate courses and seminars in Methodology BA 292 A to D (Integral Concepts in Research and Theory I-IV) and so does the Faculty of Commerce and Business Administration at the University of British Columbia: Com. 531 (Statistical Methodology), Com. 521 (Theory, Research and Methodology in the Study of Organizational Behavior), Com. 593 and 594 (Seminar in Research Methodology I and II).

[6]Machlup, for instance, asserts that: "Methodology in the sense in which literate people use the word, is a branch of philosophy or of logic, though some logicians prefer to regard logic as a part of methodology. Semiliterates adopt the word when they are concerned neither with philosophy nor with logic, but simply with methods... They do not understand that the same method may be justified on very different methodological grounds, and that from the same methodological position one may defend very different methods of research, from "Problems of Methodology -- Introductory Remarks" by Fritz Machlup, American Economic Review, Vol. 53, No. 2, May 1963, p. 204.